

JOURNAL *of* FARM ECONOMICS

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MARKET PRORATES AND SOCIAL WELFARE

FREDERICK V. WAUGH

Bureau of Agricultural Economics

THIS paper will be concerned primarily with prorates which determine how a crop of a given size is to be marketed rather than with prorates which determine how large a crop is to be grown or sold. There is a widespread belief among marketing men that the greatest income which can be obtained for a crop of a given size is that resulting from the process commonly described in textbooks as "orderly marketing"; meaning a distribution which is so adjusted that each unit returns the same net price at the shipping point. There is also a widespread belief that this process of orderly marketing maximizes consumer satisfactions and social welfare generally.

As a result of some study of market prorates during the past two or three years I have become convinced that both of these beliefs are false, and that it is possible to raise growers' incomes and to benefit the consumer and society in general by certain types of prorates which are definitely intended to establish and maintain different net prices for different parts of the crop. A recent paper¹ in which I collaborated states what I believe to be the correct principles which must be followed to maximize the income obtained from selling a crop of a given size, and briefly mentions some of the social implications of prorate schemes. During the past year I assisted Dr. Wellman somewhat in preparing a

¹ Frederick V. Waugh, Edgar L. Burtis, and A. F. Wolf. "The Controlled Distribution of a Crop Among Independent Markets," *Quarterly Journal of Economics*, November, 1936.

detailed discussion of market prorates for a committee on marketing research.² In the present paper I shall try not to cover too much of the ground already covered in the previous paper and in Dr. Wellman's outline. I shall try to clarify a few points which appear to have been confusing in the previous papers and shall try to show how some kinds of prorates may at the same time raise the income of growers and benefit society as a whole.

Some Misunderstandings

The paper that I wrote with Burtis and Wolf showed that the income of growers was maximized only when the distribution of a crop was such that marginal net returns for different parts of the crop were equal. It is conceivable, of course, that such a distribution would make net prices of the different parts of the crop equal also. This would be true if the elasticity of demand were the same in each part of the market at a given price; that is, if the several demand curves for different parts of the crop were what Mrs. Robinson calls "iso-elastic."³ Now, it seems to me very unlikely, —in fact, practically impossible—for even two true demand curves to be iso-elastic. Whether the two curves represent the demand situations in two cities, at two periods of time, by two groups of consumers, or for two forms of the commodity, some differences are almost inevitable.

Nevertheless, two demand curves, or several demand curves, may be almost iso-elastic if the characteristics of the parts of the market are alike. For example, the demand curves for a commodity in several cities where consumers have approximately the same tastes and the same distribution of incomes are likely to be almost iso-elastic. In this case there may be little difference between the distribution which equalizes marginal net returns and the distribution which equalizes net prices. In fact, the errors in our data and in our analytical methods may be such that we cannot be

² I am also glad to acknowledge that my thinking on this subject has been influenced by Dr. E. G. Nourse's excellent book, "Marketing Agreements Under the A.A.A.," Brookings Institution, 1935.

³ Joan Robinson, "The Economics of Imperfect Competition," 1933. Chapters 15 and 16 of Mrs. Robinson's book give a good theoretical background for the economics of differentiated prices.

sure which market is most elastic or which is least elastic. In our paper on "Controlled Distribution," etc. one of our examples was the distribution of Tokay grapes among several cities. Our analysis was based on a study by Dr. E. A. Stokdyk. He has called my attention to the fact that in reading and smoothing his curves we introduced errors which made considerable difference in the results, and has questioned whether our conclusions might not depend mainly on such errors.

I have since obtained from Dr. Stokdyk his original curves and have shown that the same general conclusions apply. If his curves are correct the income from Tokay grapes would have been maximized by a mild degree of dumping in New York City which would have maintained lower prices there than in the other cities. However, it is quite apparent that in some practical cases our data and our analysis may be considerably in error and in such cases it is quite possible that we might be led astray by unreliable demand curves and that a distribution intended to maximize income by equalizing net returns would fail to accomplish this equalization and might result in lower incomes than would be obtained from the process of equalizing prices. Yet, if we have reason to believe that the demand in market A is more elastic than the demand in market B at a given price we have reason also to think the income for the crop would be raised by a prorate which would sell more in market A and less in market B than would be sold by the process usually described as orderly marketing.

Several non-mathematicians were mystified by the use of mathematical expressions in the same paper and appear to think that it takes a mathematical genius to apply the principles discussed. This is entirely incorrect. The principles can be understood and applied by graphic methods alone and were so applied in some of the problems in the paper. The mathematical statements were intended to clarify these principles, to state them more accurately, and to provide an exact proof. However, the mathematical part of the paper might well be considered as an appendix to be read only by those interested in exact statements and in strict proofs.

Finally, there seems to be a widespread misunderstanding

concerning the effects of such prorates on social welfare, and it was largely because of this that I was asked to prepare the present paper. An example of this misunderstanding can be found in Professor Stigler's interesting paper in a recent issue of this JOURNAL.⁴ He criticizes the paper on Controlled Distribution for not pointing out emphatically that the prorate schemes we discussed were "essentially anti-social" and that the "consumer was being exploited."

We tried to show in the latter part of our paper that such schemes were not necessarily anti-social and that some varieties of these schemes might be of benefit to society. Probably some of the misunderstanding on this point arises out of a neglect to read the whole paper, but probably most of it must be ascribed to an uncritical acceptance of certain inherited doctrines about laissez faire which generally are passed down to us in garbled form. I would certainly grant that many kinds of prorates may be used, and have been used, by selfish interests for their own enrichment at the expense of the public, but it is unwise to condemn all prorate schemes simply because some kinds of prorates have been misused.

Three Varieties of Prorates Illustrated

The diagrams in the chart are intended to illustrate the effects of three types of prorates. These diagrams are unusual in one respect. Each one shows a pair of assumed demand curves for a commodity. Q_1 represents the quantities sold to consumers with medium and high incomes and is measured to the right of the y -axis. Q_2 represents the quantities sold to consumers with low incomes and is measured to the left of the y -axis. The curve to the right, then, represents in the usual way the demand of medium and high income consumers. The curve to the left is an inverted demand curve for low income consumers.

M represents assumed unit charges for marketing, transportation and processing. The total areas of the shaded rectangles under the curves represent total consumer expenditures for the commodity. The area of the heavily

⁴ G. J. Stigler, "A Generalization of the Theory of Imperfect Competition," this JOURNAL, August, 1937, paragraph beginning at bottom of page 708.

shaded rectangles represents the income of dealers, transportation agencies and processors, and the remaining, lightly shaded, areas represent the income of farmers who produce the commodity.

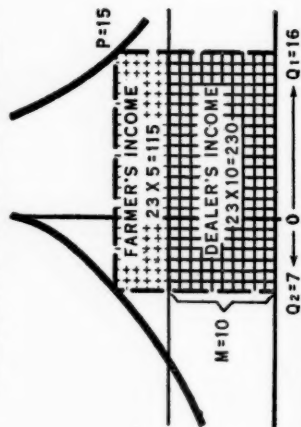
The two assumed demand curves are the same in each of the four diagrams. Perhaps a few words are necessary here to justify the difference between the two curves which were assumed to show the demand of different income groups. One of the greatest weaknesses of most of our demand research in the past is that it gives us little information about the separate demand functions for different groups of the population. However, on the basis of some fragmentary research and from purely theoretical considerations it is plausible, at least, to assume (1) that a group with medium to high incomes will pay a higher price for a given amount of a commodity than will a group of the same number of families with small incomes; or, in other words, that the effective demand of the high income groups is higher than the effective demand of the low income groups, and (2) that the demand of the medium to high income group is less elastic (or more inelastic) than is the demand of the low income group; since the low income group ordinarily will make freer use of substitutes and will vary its consumption more in general than will the group of families which can afford to buy about what it wants.

While the two curves used in these diagrams are entirely imaginary the nature of the conclusions which are indicated would be the same if any other pair of curves were used so long as the demand in the low income market were more elastic than in the medium to high-income market.

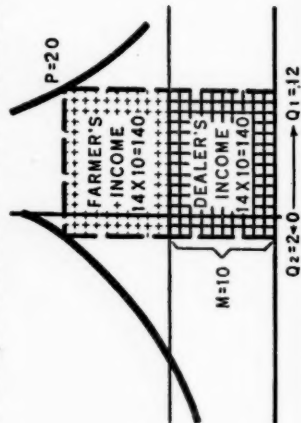
We shall describe first what the diagrams show and later will discuss some of their implications concerning public policies.

The first diagram shows what would happen if 23 units of the commodity were sold without any prorated scheme in effect. The retail price which would move this amount is $P=15$. Marketing charges represent 10 cents for each unit of the commodity, leaving the farmer 5 cents. Under the assumed conditions the income of farmers is $23 \times 5 = 115$ and the income of dealers is $23 \times 10 = 230$. The consumers who

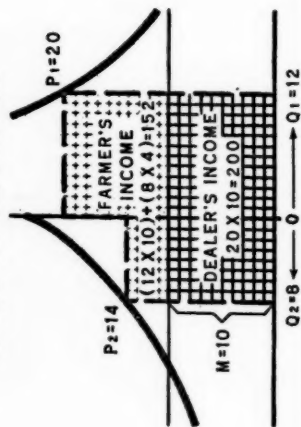
**1. NO CONTROLS: PRICE SET LOW
ENOUGH TO MOVE SURPLUS**



**2. SINGLE PRORATE REDUCES TOTAL AMOUNT
SOLD: PRICES RAISED TO ALL CONSUMERS**



**3. SEPARATE PRORATES AND
A TWO-PRICE SYSTEM**



**4. SEPARATE PRORATES: TWO PRICES; AND
TWO RATES FOR MARKETING COSTS**

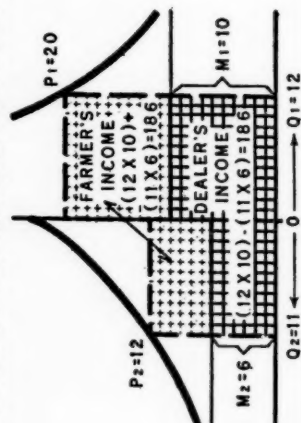


CHART 1. EFFECTS OF VARIOUS TYPES OF MARKET PRORATES

(Illustrating the Principles Determining the Effects of Such Prorates on Prices Paid by Different Groups of Consumers; on the Quantity Consumed by Each Group; and on Incomes Received by Farmers and Dealers)

have medium to high incomes gets 16 units, while the group with low incomes gets 7 units.

In the second diagram we see the effects of a single and simple type of prorate, quota, allotment, or "goal" which reduces the total quantity produced or sold from 23 units to 14 units. This raises the retail price to $P=20$, and since we assume unit marketing charges remain at $M=10$, the price to farmers is raised from 5 cents to 10 cents. This increases the farmer's income from 115 to 140 and reduces the dealer's income from 230 to 140. This sort of result is generally understood and expected. It is not so well understood that such a reduction in marketings usually affects the several income groups in very different ways. The diagram shows that the upper income group reduced its purchases from 16 units to 12 units, while reduction in the lower income group was from 7 units to 2 units. This represents a drop of 25 per cent in consumption for the first group and a drop of over 70 per cent for the second.

The third diagram illustrates a situation in which separate prorates are set up for the two parts of the market. We assume that the upper income group is sold the same amount it got in diagram 2; namely, 12 units; but that the lower income group is given a separate prorate, or allotment, of 8 units. This results in two prices. The upper income group pays $P_1=20$, as before, while the lower income group pays $P_2=14$. Assuming that marketing charges are still 10 cents for each unit, the farmer's income is raised to 152 and the dealer's income is 200. The amount consumed by the upper income group is the same as in Diagram 2, but the consumption in the lower income group is increased to the point where it is actually more than it would be with no prorate at all. Perhaps it would be well to note here that none of the prorates on these diagrams was drawn to get for the farmer the exact maximum income. If they had been so drawn the lower income group in Diagram 3 would have consumed slightly less than in Diagram 1, but substantially more than in Diagram 2.

Diagram 4 is a variation of Diagram 3. We now assume that we have not only two prorates and two retail prices, but that it is possible to lower marketing charges on the

part of the crop allotted to the lower income group. In place of $M=10$ we now assume that $M_1=10$ and $M_2=6$. This makes it desirable from all standpoints to increase the allotment Q_2 from 8 to 11 units. The income of farmers is now 186. The dealer's income is also 186. The upper income group consumes 12 units, while the lower income group consumes 11 units.

Before proceeding with a discussion of some of the implications of these diagrams we note that Diagrams 3 and 4 give the farmers greater incomes than they get in either Diagram 1 or Diagram 2, and they both give dealers greater incomes than they get in Diagram 2. Moreover, both Diagrams 3 and 4 result in an increased consumption of the commodity by the lower income group.

Some Implications

I believe these diagrams will help some of us to think a little more clearly about the relation of prorates to social welfare. This problem clearly involves both farm relief and fair treatment of the consuming public,—however we may define the word “fair.” There are perhaps two main questions which I prefer to discuss in the following order: (1) if, for any reason, it is believed to be desirable to abandon laissez faire and pure competition as the sole regulator of quantities produced and sold and to substitute a prorate scheme, should this prorate be uniform in all parts of the market or should separate prorates be established for different parts of the market? (2) Under what conditions, if any, is any kind of prorate scheme desirable?

The first question is long, but I think it has a simple answer. I believe the situations represented by Diagrams 3 and 4 are both better from all standpoints than that in Diagram 2. They provide more income both for the farmer and for the dealer. They provide the same quantity of the commodity for the upper income group as does Diagram 2 and they provide much more for the lower income group. They provide also for a fuller utilization of productive resources.

Thus, if prorates like those in Diagrams 3 and 4 can be worked out and administered in a practicable way they appear to have greater possibilities of raising farmers' incomes

and to be more desirable from the consumers' standpoint than a flat reduction in output.

There doubtless are many practical problems which need to be met in establishing and maintaining separate prorates which grant lower prices to lower income groups of consumers. Probably the two most serious practical problems are: first, to segregate the two consuming groups in such a way that only the consumers with low incomes can take advantage of the lower prices; and, second, to work out an equitable distribution of benefits among farmers so that some of them will not be paid the higher prices and some the lower prices. I believe there are practical ways of working out these problems. In fact, they have been quite successfully worked out on a small scale under some of the marketing agreement and surplus disposal plans of the Agricultural Adjustment Administration and by some similar marketing schemes which are being tried in England, Germany and other foreign countries. The recent experiment of selling 8-cent milk to low-income families in New York City is another example. I shall not discuss here the details of applying these principles to actual marketing programs, but believe there are many ways of putting such a plan into effect for marketing some of the principle foods.

I have stated my opinion that a system of two or more prorates for consuming families with different income status is always more desirable in principle than a flat reduction in output. Perhaps a more serious question in many cases is whether or not any sort of prorates or quotas are desirable. We know from theory and from actual trial that under certain circumstances the income of growers can be raised either by reducing output or by regulating its distribution, or by a combination of both. If the output is reduced there is less food to distribute among consumers, and if prices are raised throughout the whole market we are likely to have a situation like that shown in Diagram 2 where consumers with low income were forced to curtail their purchases sharply.

Recent studies by Dr. Hazel K. Stiebeling⁵ and others show that even in normal times a substantial percentage of

⁵ A brief summary of some of Dr. Stiebeling's most important conclusions will be found in "The Agricultural Situation," U.S.D.A., December 1, 1937.

families in the United States are undernourished. This is particularly true of families with low incomes. Moreover, there is good evidence that low incomes and inadequate food lead to high rates of sickness and unemployment.⁶ Prorates which raise prices throughout the market, therefore, should be undertaken only when the harm done to the consumer by higher prices is clearly offset by definite benefits to producers and others. Probably this would never be true in a static economy in which competition between small producers was dominant. However, reduced production can be defended easily as an emergency measure if in the long run it helps to keep in business producers who will be needed in the future, and it can be defended in the case of a particular industry if most other industries are organized in such a way as to hold production in check and to maintain high prices.

But I believe some thought might well be given to a program of multiple prorates and graduated prices for some of the basic foods as a permanent policy entirely aside from the needs for farm relief which may arise either from temporary conditions of emergency or from the fact that the producers of these foods must buy in a market which already has lost some of its competitive features.

It will be noted that Diagram 3 calls for very little reduction in output and that the output in Diagram 4 is equal to that in Diagram 1 without any prorate. The main difference is that in Diagrams 3 and 4 the prices are graduated. They are raised to the high income group and dropped to the low income group. This results in changing the distribution of the crop so that the high income group gets less and the low income group gets more. I believe that in many cases such prorates would allow for greater production rather than less; particularly if marketing costs also could be graduated as shown in Diagram 4. This will be explained more fully in the following section. Assuming for the present that it is true, it appears that certain types of prorates might be of permanent value to the general public as well as to the

⁶ A particularly interesting recent study is "Illness and Medical Care in Relation to Economic Status," Bulletin 2, Sickness and Medical Care Series, U. S. Public Health Service, 1938.

farmer. This is particularly true of the basic foods which are necessary to maintain the health of our population.

Some Remarks About Graduated Prices

Many readers of this JOURNAL will think that the foregoing paragraph is an economic heresy. It certainly runs counter to the doctrine of laissez faire and I am old-fashioned enough to have a good deal of respect for that doctrine. However, I have been rereading rather carefully the arguments leading to the widespread opinion that the process of pure competition tends to result in the best possible utilization of economic resources and to maximize social welfare generally. The most precise statements are to be found in the writings of the mathematical economists. Their precise conclusions may be summed up by the following free translation of a passage from Walras,⁷

"Free competition in exchange and in production results in a maximum of utility from goods and services with this reservation; that there is a single and uniform price for these goods and services among all buyers and sellers."

I, for one, am willing to grant these conclusions as stated by Walras except for temporary emergencies when there may be serious maladjustments in the economic system, and with the comment that it must mean free competition in *all* industries. However, the reservation is significant. Walras does not say that free competition sets the most desirable pattern of production and prices. He says simply that if all prices are to be uniform the price and production pattern set by free competition is better than any other. There may be many systems of graduated or unequal prices which would result in still more desirable patterns.

Most of us probably have a tendency to react against any proposal for setting up any kind of two-price or multiple-price system.

Such a system is ordinarily described as price discrimination. The word "discrimination" has come to have a connotation of unfairness, and it is quite evident that some of the more common forms of price discrimination have been

⁷ Léon Walras "Éléments d'Économie Politique," 1926, page 287.

unfair. For example, geographical price discrimination has been used to drive out competitors and to build up monopolies aimed at exacting as great a profit from the public as possible. I prefer to use the term "graduated prices," but whatever term is used we cannot simply assume that any such system is unfair or that it will produce undesirable results.

It is possible that further work in the pure theory of utility would throw further light on this matter. I have made a few small attempts along this line, but have no results worth mentioning. There are at least two difficulties to such an approach. The first is that it requires assumptions about the addition of the utilities and disutilities of different people and different income groups and, thus, easily becomes very unrealistic. The second is that the statistical measurement of utilities presents many real difficulties. This has been shown clearly in a remarkable paper⁸ by Hicks and Allen. However, I believe that this is not necessarily an impossible task, and that the general method developed by Frisch⁹ can be used in some cases at least to get approximate measurements of the utilities enjoyed by particular families or groups of families. I recently had an opportunity to discuss this matter with Dr. Allen, who is now in the United States, and I believe he would agree with the foregoing statement.

This much seems to me sure: that an intelligently planned system of graduated prices would make the demand for any product more elastic, and, therefore, would reduce or eliminate gains to the producer from restricting output. In fact, a completely graduated system, in which each unit sold for all it would bring, would necessarily make the demand curve for any product elastic throughout its entire length as long as positive prices were obtained for additional units. The demand for a product is elastic if increased output gives greater income. If prices were completely graduated an ad-

⁸ J. R. Hicks and R. G. D. Allen, "A Reconsideration of the Theory of Value," *Economica*, February and May, 1934.

⁹ Ragnar Frisch, "Sur un Problème d'Économie Purè," *Norsk Matematisk Forenings Skrifter*, Nr. 16, 1926.

This method was applied in simplified form in the following paper: Frederick V. Waugh, "The Marginal Utility of Money in the United States," *Econometrica*, October, 1935.

ditional unit of output would always add to income until the point was reached where it could not be sold at all.

As a practical matter, we could not operate such a scheme of completely differentiated prices, and I doubt if it would be desirable to do so if we could, but it does seem possible that a partial differentiation of prices could result in an elastic demand even for a commodity like fluid milk. If the demand in terms of prices to the grower could be made elastic there would be no incentive to reducing production.

To make demand as elastic as possible in terms of prices to the farmer we need to consider marketing charges. There should be possibilities of graduating these charges as shown in Diagram 4. In the first place there is no reason why all us consumers should get the same marketing services, and if we don't get the same services, there is no reason why the differences in the costs of these services should not be reflected in differences in margins.¹⁰ Moreover, if additional amounts can be sold to lower income groups through such prorates the charges for marketing the additional amounts might well be based on the additional costs of distribution. If the distributor is willing to handle the 14 units in Diagram 2 at a charge of 10 cents each he might well be able and glad to handle 12 units at 10 cents, plus 11 units at 6 cents. This increases his gross income considerably and the increase might well more than offset increased costs, particularly if overhead items like plant and equipment and salaries of officers were not affected.

Is This a Share the Wealth Program?

If we adopted a general program of graduating prices of all goods and services according to the ability of consumers to pay, we would equalize purchasing power. If we want such a program we might better go at it directly and redistribute wealth and incomes instead of monkeying with the marketing and price system.

I think, however, that it would be unwise to go so far as to equalize purchasing power by any method. Although the

¹⁰ This may be contrary to the philosophy behind some recent legislation regulating prices but the author believes it to be sound.

type of prorate I have discussed goes a step in that direction, it is intended to be applied only to a few basic foods.

For the basic foods like milk, bread, potatoes, and pork it seems to me that some degree of equalization of purchasing power might well be in the public interest—entirely aside from farm relief. This is recognized in our present public policy by the free distribution of such foods to families on relief. In effect this sets up a two price system: the regular market price for most of us and a zero price for relief families. One or two intermediate steps in price might be very desirable as far as consumers are concerned, might improve public health, and might encourage increased production and consumption. Granting the fact that there are practical difficulties to be overcome before such prorates can be administered properly, I believe that their possibilities warrant careful study. The general idea of a marketing agreement, or of some of the foreign marketing schemes, may have very real merit from the standpoint of public welfare—at least if the public welfare aspects are kept definitely in mind instead of administering them solely to get monopolistic gains for producers.

TYPES OF FARMING RESEARCH AND FARM MANAGEMENT¹

WALTER W. WILCOX

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I

TYPES of farming research, a major activity of farm management specialists for the past 10 years, is decidedly on the wane. This decline together with the completion of two studies in which statistical measurements of variations in the farm enterprises within limited geographical areas has been attempted² makes it appropriate to survey and evaluate the type of farming research to date, its accomplishments, its shortcomings and its probable future trend.

Shortly after 1900 farm management as a specialized field of inquiry and teaching branched off from the field of Agronomy.³ This is perhaps one of the reasons why it has always maintained a strong technological bias. The first two major fields of research were the farm management survey and cost of production studies. The task and aims of the early farm management survey was stated concisely in the 1903 report of the Secretary of Agriculture five years before the first survey was summarized in bulletin form.

In every community and in every section there will be found farmers who are much more successful than others. There are reasons for this and it is these reasons that the Department is endeavoring to determine.

Detailed cost of production studies were launched even earlier than the farm management survey with Minnesota doing the first work in 1902.⁴ The objective was to determine the physical and economic costs of production of each farm

¹ Journal Paper No. J550 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project No. 520.

² Davis, I. G., *Types of Farming and Type of Farming Areas in Connecticut*, Storrs Agr. Exp. Sta. Bull. 213, Storrs, Ct. and Wilcox, Walter W., *Heterogeneity within the Type of Farming Areas in Iowa*. Unpublished Ph.D. Thesis, Harvard University.

³ A Good History of the Beginnings of Farm Economics, the Federal Division of Farm Management and Costs and Farm Economics Extension is given by Warren, G. F., Thompson, E. H., and Smith, C. B., in papers bearing these titles, J. F. E., 14 (1932) pp. 2-22.

⁴ *Ibid* p. 3.

commodity. Both types of studies were attempting, from two different angles, to provide facts for farmers which would indicate how they might operate their farms more profitably. The farm management survey was to discover the practices and organizations which accounted for the profits of the best 15 to 20 farms out of each one hundred surveyed. The early cost of production studies were intended to determine the average costs for each enterprise and also the farm practices which made possible lower than average costs.⁵

With the development of improved statistical techniques attempts were made to increase the usefulness of these data by correlation, partial correlation, multiple correlation and other types of statistical analyses. Attempts to generalize the conclusion based on these studies always presented a difficult if not unsurmountable problem.

Nevertheless, these studies, or modifications of them, largely occupied workers in the field until in the middle of the twenties. By this time a realization of the limited significance of cost data and their heavy drain on research resources led to a decline in the popularity of cost of production studies.⁶ Although the farm survey continued to be the important phase of farm management research in New York State, in many other states after completing a few of these, interest began to turn to other channels. Analysis of budgetary data for typical farms rather than correlation and cross classification of data for a sample of farms found favor in some quarters.⁷ Statistical analyses of sample data together with the desire to be able to present budgetary information for typical farms emphasized the need for segregating farms with similar characteristics into separate classifications. It is in this general background that the type of farming approach was incubated.⁸

The first bulletin on types of farming written in 1919 by

⁵ Taylor, H. C. The objectives in Agricultural Cost Accounting, J. F. E., 5 (1923) pp. 65-78.

⁶ Bennet, M. K., Farm Cost Studies in the United States, Food Research Institute, Stanford University, California 1928.

⁷ Minn. Agr. Exp. Sta. Bul. 205: A Study of Farm Organization in Southwestern Minnesota by Geo. A. Pond and Jesse W. Tapp published in 1923 was one of the earliest studies using this approach.

⁸ It is not meant to infer that the major part of the resources for farm management research were utilized in studying types of farming after this period. Enterprise cost studies, labor and power utilization and other similar studies continued to occupy many workers in the field.

Spafford of Nebraska was an attempt to correlate geographic factors with the size of farm and type of farming.⁹ The second bulletin on this subject was written for a farmer audience by Spillman in 1923. In this he drew on his fund of information accumulated over a period of 20 years in farm management research in the United States Department of Agriculture.¹⁰ Taking up the states by groups Spillman showed census statistics of their agricultural production and discussed the factors accounting for the differences observed under the three headings—physical, biological and economic factors. New England problems must have concerned him most at that time for he devoted a section to “logical types of farming for New England” but favored no other states with a comparable section.

It was not until 1927, however, that type of farming research really got under way. In this year the first of a series of remarkably uniform state bulletins¹¹ dealing with types of farming and type of farming areas appeared. The period 1927 to 1937 may well be called the type of farming decade in the history of farm management studies.¹²

From the beginning two different ideas of the function and objectives of type of farming research were held. Holmes working in Iowa undertook a study of types of farming “primarily for the benefit of the staff engaged in farm management, teaching and research”¹³ But as he went into the problem further he became convinced

that the geographical phase of Iowa farming was an important one; that is, that the differences which were discernible in the types of farming in the different parts of the state were due to natural and economic causes whose relation to the farmers’ problem should be definitely known and understood by everyone having to do with agricultural education and agricultural leadership and by the farmers themselves.¹⁴

⁹ Spafford, R. R., *Farm Types in Nebraska as Determined by Climatic, Soil and Economic Factors*, Nebraska, Agr. Exp. Sta. Res. Bul. 15, Lincoln, Neb., 1919.

¹⁰ U.S.D.A. Farmers bulletin 1289.

¹¹ Willard, R. E., and Fuller, O. M., *Type-of-Farming Areas in North Dakota*, N. D. Agr. Exp. Sta. bul. 212, 1927.

¹² In some states two or three bulletins were published. A large amount of federal help from the Division of Farm Management and Costs led to studies in almost all except the Southern States.

¹³ Iowa Agr. Exp. Sta. Bul. 256. 1929. p. 119.

¹⁴ *Ibid.* p. 120.

Elliott and Tapp of the Bureau of Agricultural Economics and Willard of North Dakota writing in 1928 had quite a different purpose in investigating types of farming followed in North Dakota. They said,

In recent years a great deal of attention has been given to the development of regional, state and local agricultural programs—a program for the so-called average farmer is too indefinite. Blanket recommendations are not specific enough and, furthermore, are likely to be misleading. What is needed is a segregation of farmers into specific groups on given sizes of farms and in homogeneous type-of-farming areas so that a correct appraisal can be made of the needs of typical groups.¹⁵

About this same time Elliott published an article in this JOURNAL in which he developed more fully the technique for determining typical groups.¹⁶ In this article he dismisses the problem of locating the boundaries of an area in a sentence or two but goes into considerable detail in showing how groups of farms can be located statistically which may be used for the same purpose in agricultural economics as the Representative Firm was used by Marshall in general economic analysis. Elliott used this approach in most of the studies of which he was author or co-author over the next five years.

The point of view expressed by Holmes in his Iowa bulletin is a tacit recognition that type of farming investigations are largely in the field of economic geography. In this he follows Spafford. Elliott and his associates in emphasizing farm classification and the statistical determination of typical groups implies that it is merely a first step in the quantitative analysis of farmers economic problems of adjustments in the combination of the factors of production.

II

All of the studies previous to the 1930 census described the agriculture of the states in terms of township and county averages. The different type of farming areas were segregated

¹⁵ Elliott, F. F., Tapp, J. W., and Willard, R. E., *Types of Farming in North Dakota*. U. S. Dept. of Agr. Tech. Bul. 102, 1928, p. 1.

¹⁶ The "Representative Firm" idea applied to research and extension in Agricultural Economics, J.F.E. Vol. 10. p. 483.

on the basis of differences in the importance of the enterprises as indicated by these averages together with a consideration of the natural physiographic features. In the studies on which Elliott was co-author typical farms were presented for representative counties within the areas. Description of the quantitative importance of the various farm enterprises and their correlation with other factors far outweighed the statistical analyses of individual farm data even in these studies. Almost without exception Spillman's classification of the factors affecting types of farming was followed, that is, they were classified either as physical, biological or economic factors. The analyses ran in quite general terms. There was almost no discussion of the variation in types of farming within the areas. In the few cases where these variations were mentioned the explanations ran in such general terms as variations in family labor, mortgage debt load and inter-area variations in the resources. The reasons put forth were a result of other studies rather than conclusions growing out of the particular study at hand.

The studies have been largely a graphic presentation of census data showing correlations with soil resources and climatic differences. Such a characterization of these studies previous to 1930 does not imply that they were valueless. On the contrary they were of considerable value. But regardless of the hopes or expectations of the authors all of these type of farming publications were most useful in the general education of workers in agricultural economics and in other fields. They have been used by agricultural students in colleges and high schools, too. But they contributed but little to the analysis of farmers' economic problems.

During the decade of the twenties the Bureau of Agricultural Economics took the leadership in developing a new program of education in agricultural economics. Believing that the rapidly changing economic conditions following the World War and proper adjustments to them constituted a major farm problem they launched the "Outlook."¹⁷ Pro-

¹⁷ Nourse enumerates and gives an interpretation of the various stages in the government's attempt to facilitate economic adjustments in agricultural production in, "Fundamental Significance of the Agricultural Adjustment Concept" J.F.E. Vol. 18. p. 244-256, 1936.

duction and price analysis with interpretations and specific recommendations to farmers were the backbone of this program.

Not satisfied with the form in which the basic data were available in the census and conscious of the gap between determining probable changes in prices and the economic adjustments available to farmers, agricultural economists asked that farms be classified by type in the 1930 census tabulations. Elliott undertook this job and classified all farms into 11 types except for a small unclassified group. The proportion of the total income from a given source was the criterion of classification. Under pressure of limited time and resources little more was done than to classify the farms. Taking into account the density of farms of particular types and other information at hand, the United States was divided into 514 type of farming areas and a number of sub-areas.¹⁸ Again the discussion of the why of their location ran in general terms mostly on the basis of information gained by the author from other sources.

Following this nation-wide study which of necessity was general in nature, the Division of Farm Management and Costs under Holmes' direction vigorously pursued more detailed type of farming studies in cooperation with individual states. The published bulletins resulting from these studies indicate that additional local data have been summarized, the variation in resources has been described more minutely and past trends in production have been charted.¹⁹ Little has been added to Elliott's work, however, either in the way of explaining the existence of the present individual farm operating units or in expressing in economic terms the relative importance of the variables within and between areas.

Davis, dissatisfied both with Elliott's method of classifying farms and with the approach used in other states as they applied in Connecticut, in 1931 undertook to classify farms according to the amount of labor used in the various enter-

¹⁸ Elliott, F. F., *Types of Farming in United States*, 15th Census of Agriculture, Bureau of Census, 1933.

¹⁹ One or more bulletins were published by the agricultural experiment stations in the following states covering this cooperative work: Arkansas, Colorado, Idaho, Illinois, Kentucky, Minnesota, Montana, Oregon, Pennsylvania, Utah, Washington and Wisconsin.

prises. Davis believed the average amount of labor required per year was the best common measure of size for the different enterprises on Connecticut farms. Incompleteness of the federal census prompted Davis to survey 50 towns in Connecticut and use the basic data obtained in them together with information obtained from local people to describe the modal types of farms found in the State. He delineated several hundred "type of farming" areas where Elliott had mapped only 6.

Davis' work represents an attempt by the use of approved statistical techniques to classify Connecticut farms on a sample basis. He then described what, from the standpoint of farm management, seemed to him to be the most important variables for the modal or quantitatively most important group. His objective as stated in his foreword is almost identical to that expressed by Elliott, Tapp and Willard quoted earlier.

The present work is motivated by the desire to set up a better factual basis for adjusting public agricultural policy and proprietary business policy to the conditions on individual farms in Connecticut.

Without doubt classifications of farms either according to source of income or use made of labor is a descriptive technique which makes the results more valuable to the farm management worker than a graphic presentation of township and county land utilization and production data. Davis' work is the most thorough and detailed type of farming study using this technique. The possible future contribution of type of farming studies to the analysis of farm management problems can only be evaluated by the considering of the extension of this more thorough and detailed procedure.

III

How do the standard objectives of type of farming studies stand up under a critical appraisal? The objective of acquainting the public (including farm management workers) with a more understandable picture of the correlation between agricultural production, size of farm, agricultural resources and geographic location while worthy, unmistakably

classes the activity as economic geography or descriptive land economics. Description of agricultural resources and their use is an excellent objective. The clientele for which it is prepared will to a large extent dictate the amount of detail to be included in the description. There is in this a definite conflict of interest between the needs of the general public and that of the farm management specialist. Description in terms and in sufficient detail to be of greatest use to the specialist is relatively unintelligible and useless for the general public. Another inherent difficulty of these descriptions is their tendency to get out of date.

The objective of *accounting* for the particular form of agriculture, that is, the type and scale of its units, is definitely in the field of farm management. If accomplished, it would provide a basis for predicting the effects of postulated changes in any of the production factors. But has any type of farming research project been undertaken seriously on such a level? True this objective is usually written into the project statements. Holmes, in unrecorded discussions, has indicated that it was along these lines that he hoped to achieve significant results by pursuing the more detailed studies following the 1930 census. Accounting for the particular pattern of agriculture in an area in more than general terms is far from a simple task. The progress toward this objective even in these later studies thus far has been practically nil for the reason that almost all the available resources have been allocated to the descriptive phases. Graphic, statistical or verbal description is much easier to do. Apparent accomplishments run much higher. It is more generally appreciated by the public. But the description may or may not run in terms of characteristics which are important for the solution of economic problems. Usually it does not. Economic analysis of value in farm management is the process either deductively or inductively, of establishing relationships which will explain the unique combination of enterprises and practices found on the individual farm. The question may be raised as to whether such an objective is not too ambitious to be capable of attainment for all farms in a state in a reasonable period of time. Perhaps analytical work should be undertaken on an enterprise basis. However,

analytically to explain the type and size of a particular enterprise one must account also for the type and size of all other enterprises. The problem is not unlike that of deriving a statistical demand curve which meets all the theoretical requirements.

The objective of the delineation of "relatively homogeneous" type of farming areas appears to be more of an intriguing exercise in description than a contribution to farm management. Without question boundaries of type of farming areas have more economic significance than most political boundaries. On a scale small enough to be really homogeneous though, as Davis' study shows, their number is so great as to preclude their use as units in the administration of an educational, adjustment or research program. On a larger scale, unless it is much larger than that used in most state publications, conditions within the areas are so diverse and average conditions within two adjacent areas are so similar that the differentiating of educational, research or action programs according to areas would accomplish less than by providing for greater adaptations according to defined characteristics of the individual farms.²⁰

The unsuitability of type of farming areas as units in a national adjustment program is suggested if not proved by developments in the past 5 years. In 1930 when it was realized that the program of the Federal Farm Board and the dissemination of outlook information were inadequate to stave off financial insolvency for large groups of farmers, one of the first solutions offered was the planning of adjustments in agricultural production by areas.²¹

When the AAA came into existence, it began to function on a commodity basis which in many respects was roughly equivalent to dealing with the problems by regions. The Administration lost no time in setting up a Division of Program Planning. This division began work on several phases of the problem of developing a coordinated adjustment program adapted to the needs of the different areas within the

²⁰ This point is developed with supporting data in a manuscript by the Author in process of publication by the Iowa Agr. Exp. Sta.

²¹ Christgau, Victor, Legislation needed to bring about readjustments in Agriculture. Proc. Amer. Assoc. of Land Grant Colleges 44: 123-130. 1930.

larger regions producing the basic commodities. One of the first steps was the publication of a map in which Dr. Elliott combined his 514 types of farming areas into 100 larger areas together with a description of the basic adjustment problems faced in the Corn Belt, the Cotton Belt and the other major producing regions of the United States.²² This was followed by more intensive studies of the adjustment problems in cooperation with the states in which individual area adjustments chiefly in the interests of soil conservation were recommended.²³ County Agricultural Planning Committees in most counties jointly sponsored by the AAA and the Extension Services have formulated recommended land use adjustments on a county basis which have been summarized also by type of farming areas.

But adjustment programs are now moving in the direction of greater individual farm flexibility rather than greater area flexibility. This is indicated by the adoption in the North Central Region of an individual farm rating of the present condition of the soil resources. The extent to which these ratings will depart from historical bases remains to be seen.²⁴ Thus far, however, there have been no administrative rulings permitting differentiation by areas within the regions. A part of the explanation lies in the tendency of the program to include in it an element of subsidy as well as payment for real adjustment. A large part of the reason, however, must be the inability of individual areas to show that within sharp and easily discernible boundaries the character of the adjustment problem is different than in the areas within other boundaries.

How much has been or can be gained by classifying farms into homogeneous groups? Elliott classified all the farms within the United States into 11 groups according to source of income. But there was too much heterogeneity within these 11 large groups to permit their use for purposes other than contrast and description. Most of the farms in Iowa are animal specialty farms according to Elliott's method of

²² Problems in Agricultural Adjustment, Agricultural Adjustment Administration—pub. G 31, 1935.

²³ The methodology of these studies is described by Schickele, Rainer, "Economics of Agricultural Land Use Adjustments." Iowa Agr. Exp. Sta. Res. Bul. 209.

²⁴ Other regions have not even adopted this type of flexibility.

grouping. Such a grouping based on source of income does not differentiate according to production costs and conservation requirements, variables important in setting up a national adjustment program. Davis' classification appears to be much more precise. Yet he tells us:

A group of farms may be homogeneous for one purpose or point of view . . . and quite heterogeneous from other standpoints . . . the variety of factors . . . impinging on the farmer's net income are so many that on no two farms are exactly the same factors responsible for the approximate size of the net income.²⁵

The conclusion is reached that in the small state of Connecticut a group of farms characterized as a 6-10 cow dairy group would have to be subclassified into 5 to 10 subgroups to get sufficient uniformity to permit using one of the farms as typical of the group with respect to organization and management problems.

In discussing homogeneity of groups and representative farms from the standpoint of the application of farm adjustment policies designed to maintain or increase farmer income, he points out:

The criteria of classification to be used for selecting representative farms for making a specific adjustment may require modification suitable to the purpose of the adjustment to be made.²⁶

He concludes his discussion with respect to typical farms:

For the author to attempt to select and describe a farm or farms representative of this or any other subclass would . . . require the assumption of a specific purpose and would require an extended excursion into farm management analysis which is beyond the scope of this work.²⁷

The hopelessness of using a statistically determined modal group of farms as representative of the behavior of the entire group is suggested by a study by Wells. In studying farmers' response to price in hog production he found that 80 per cent of the expected increase in farrowings in 1927 over 1926 was accounted for by men who had no sows that farrowed in

²⁵ Davis, I. G., Types of farming and type of farming areas in Connecticut. Bul. 213. Storrs Agricultural Experiment Station, Storrs, Conn. p. 47.

²⁶ Ibid. p. 48.

²⁷ Ibid. p. 48.

1926.²⁸ The December pig survey in 1926 indicated that farrowings in 1927 would total 5.6 per cent larger than in 1926. At the other extreme producers with more than 11 sows on an average expected to decrease their farrowings by a small percentage. Size of sow herd was an important factor associated with direction and amount of change in hog production on the individual farms from 1926 to 1927. The modal group of farms with respect to the size of their herd could not reflect these differences.

Farm classification by and within geographic areas, unless there is subclassification on all the variable attributes of the resources is likely to prove an unreliable source of information for economists. But on the other hand such a detailed classification would be so unwieldy as to be of doubtful value. So long as they are merely sample or generalized classifications on a limited number of criteria, as has been the case in all types of farming studies to date, the classifications are useful as techniques of description, nothing more.

This critical appraisal of the type of farming studies of the past decade should not be interpreted as damning them as of no value. There is no way of evaluating the information they have given the public with respect to the variations in resources and their use in the United States. The basic data for the studies thus far have been inadequate for the precision in description and analysis which is necessary to make the farm classifications (either by geographic areas or other criteria) most useful for the analysis of farm management problems. A more serious problem arises in that the detail which seems to be inevitable if "relative homogeneous" groups or areas are to be segregated would severely limit their usefulness even for the farm management specialist. Since homogeneity from one point of view may not mean homogeneity from another point of view, the usefulness of either detailed statistical or area classifications—except in connection with specific problems to be solved—can hardly be expected to justify their expense.

Type of farming studies have failed to contribute more to

²⁸ Wells, O. V. *Farmers Response to Price in Hog Production*. U.S.D.A. Tech. Bul. 359, 1933. p. 34.

the development of farm management or production economics largely because they have failed to establish the connection between the variations in the resources and their use, which are described, and their price sensitiveness.

In attempting to follow through the implications of a postulated change the important thing to know is the indifference curves or price change necessary to induce given quantitative shifts in the use of cost factors or in output. Statistical studies of farmers' response to price changes by individual commodities have been undertaken on a national basis. These studies have never been broken down by subgroups of producers who on the basis of carefully thought through hypotheses might be expected to show a different quantitative reaction to given price or technique changes.

The main object of this article has been to evaluate the contribution type of farming research has made to progress in production economics. A careful appraisal of both objectives and methodology should lead to a more fruitful research program. To the writer the cornerstone of such a research program appears to be a study of historical data on farmers' response to price and cost changes on a commodity basis. These supplemented by careful theoretical analyses, where empirical data are lacking or inconclusive, should do much to fill the present gap in data needed for a sound production adjustment program. The farther and the faster the national aggregate data are broken down by subgroups with similar quantitative price sensitiveness the more adequate will be the basis for a production adjustment recommendation or policy.

THE SOIL AND THE LAW: I¹

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THERE is a frontier on which land-use programs confront the law. It is the purpose of this article to explore this frontier—to indicate some of the problems which must be solved if remedial measures for the better handling of our soil resources are to be translated from paper programs to living institutions, that is to say, are to be enacted into law, administered, and made effective.

Let us recall the nature of the remedial measures most frequently proposed. They include: Control of soil erosion on private and public lands; retardation and reduction of water run-off on the watersheds, in aid of flood control; an agricultural production safeguarded against oversupply as well as against shortage caused by drought or other natural agencies; retirement of submarginal land from cultivation or other improper use, and its devotion to uses in the public interest; assistance to farm tenants to enable them to become owners; readjustment of the relationships of farm landlord and farm tenant, to improve the tenure system; better management of grazing on private and public range lands; rural zoning to correct maladjustments in land use; revision of tax structures to encourage proper land use and discourage the reverse. These are the highlights.

These proposals involve action by the Government, as distinct from private action. It should be noted further that they involve at least three types of Government activity:

- (1) Direct administration of lands by the Government. Instances are the national and State forests, parks, the public domain, Indian reservations, wildlife refuges.
- (2) Public regulation of private land use. Instances—zoning ordinances, land-use regulations adopted by soil conservation districts, statutory requirements applicable to farm leases.
- (3) Subsidies paid by the Government on the condition that stated land-use adjustments are made. Familiar instances

¹ This article gives in greater detail certain material prepared by the author for the 1938 Yearbook of Agriculture, not yet published. Any duplications of material in the Yearbook article are used by arrangement with the editor.

are the A.A.A. benefit payments and the assistance given by the Soil Conservation Service to farmers within erosion control demonstration projects.

For some purposes it will be important to break down this classification in terms of the level of Government—national, State, or local—concerned.

Under the political theory which is dominant in this country, the functions of government are considered to be divisible into three parts—legislative, executive, and judicial. Because of this theory our constitutions, both national and State, provide for a separation of these governmental functions among independent agencies, generally prohibiting the “invasion” of the field of each by either of the others. An action program that is to be undertaken by the Government necessarily involves, therefore, first, the formulation of the program and its enactment into law as a statute; second, the enforcement and administration of the statute by the executive; and third, the interpretation and application of the statute, in disputed cases, by the courts. The farmer on the land, and the scientists and economists concerned with action programs dealing with land use, confront the law, therefore, on these three sides.

Our Federal System—Powers and Limitations

In the United States land program administrators must consider not one but forty-nine sovereigns. The Federal Constitution establishes the United States as a government of limited (delegated) powers. The United States may exercise only those governmental powers granted, expressly or by necessary implication, in the Federal Constitution. The several States, on the other hand, are governments of inherent general power. They may exercise any governmental power not forbidden them, again either expressly or by necessary implication, either in the Federal or in the State constitution. It results that, for a Federal statute to be demonstrated to be within governmental power one must point to language conferring the power, while a State statute must be deemed to be within governmental power unless one can point to a prohibition of the exercise of such power.

The legislative field open to Congress is defined in section 8

of article I of the Federal Constitution, as supplemented by provisions in several other sections as well as by the amendments later adopted. The powers conferred upon Congress that are relevant to the action programs here referred to, may be listed as follows. Congress has power:

- (1) To collect revenues by taxation;
- (2) To spend the proceeds of taxation "to pay the debts and provide for the common defense and general welfare of the United States";
- (3) "To regulate commerce with foreign nations, and among the several States, and with the Indian tribes";
- (4) To "dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States"; and
- (5) "To make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other powers vested by this Constitution in the government of the United States, or in any department or officer thereof."

On the asset² side of the ledger of governmental power we may, then, enter these powers for the nation, while we may make an entry of inherent general governmental power for each State. For the liability² side of the ledger we must note the following important limitations upon the exercise of governmental power.

In the case of the action programs with which we are here concerned, the most important of the limitations placed by the Federal Constitution upon the Federal Government are the following:

- (1) No "person" may be "deprived" of "liberty" or "property" "without due process of law."
- (2) There is an inherent limitation in the second grant of power just mentioned; the "spending power" (aside from its use for paying the debts and providing for the common defense) must promote the "general welfare." For no other purpose may the proceeds of taxation be spent.
- (3) The tenth amendment recites that "The powers not delegated to the United States by the Constitution, nor pro-

² The terms "asset" and "liability" are used, of course, only in their immediate sense. It is not intended to deny that a particular limitation upon government power may be desirable, and hence—from the citizen's point of view—an asset rather than a liability.

hibited by it to the States, are reserved to the States, respectively, or to the people." (This may not appear to be a limitation upon the exercise of those powers which are delegated, but we shall see that it has become such a limitation.)

- (4) The Congress, the President, and the courts are forbidden to delegate to either of the others any of the powers conferred, and no one of the three may invade the field assigned to either of the others. (This limitation is not to be found in any express provision of the Constitution, but has been derived by the Supreme Court from the structure of the document as a whole.)

Upon the States the Federal Constitution imposes the following limitations (again confining ourselves to the principal limitations relevant to the remedial measures here discussed):

- (1) No State may "deprive any person of . . . liberty, or property without due process of law."
- (2) The proceeds of taxation may not be expended upon other than a "public purpose." (This has been judicially derived, not from any express provision of the Constitution, but as an implication of the provision that no State may deprive any person of property without due process. Many State constitutions, however, make this limitation explicit.)
- (3) No State may "deny to any person within its jurisdiction the equal protection of the laws."

The State constitutions generally repeat the limitations on the exercise of governmental power by the States summarized above from the Federal Constitution. Many impose additional limitations, a few of which should be here noted:

- (1) All but a very few, expressly or by judicially derived implication, prohibit delegation of power from one department of the government to another, and invasion of the respective spheres. (It is important to note that the Federal Constitution does not require separation of powers for the State governments, although it does require such separation for the Federal Government.)
- (2) The constitutions of ten States prohibit either the State or political subdivisions of the State, or both, from engaging in "works of internal improvement"; or impose limitations on such action.

- (3) The constitutions of forty-five States prohibit the "lending or donating," by the State or political subdivisions, or both, of credit, money, or property to or in aid of private persons.

Another item should be entered on this ledger. Under section 10 of article I of the Federal Constitution, two or more States may enter into an agreement or compact, but only with the consent of Congress.

It will be obvious that if we were now to discuss each of the remedial measures named, in order to indicate what governmental powers are involved in each and what constitutional limitations are applicable, this article would be unduly prolonged. Two of these remedial measures, however—the State Soil Conservation Districts Laws for erosion control (including flood control work on the watersheds), and the Federal program of agricultural adjustment—present rather characteristic pictures. They involve most of the legal problems common to the other action programs. We may therefore confine our discussion to these programs.

State Soil Conservation Districts Laws

The provisions of the Standard State Soil Conservation Districts Law, the problems it seeks to solve, and the provisions of the statutes modeled on it which have been adopted in 22 States, have been summarized elsewhere, so that general familiarity with them may be assumed.³ These State laws provide for the organization, on the basis of petition, public hearing, and referendum, of soil conservation districts as governmental subdivisions of the States, with power to assist farmers in carrying on erosion control operations and to enact into law land-use regulations needed for erosion control.

State or Nation

The initial problem that confronted the drafters of the Standard Act was: Should the statute be drawn in form appropriate for adoption by the Federal Congress, or be submitted to the State legislatures? This basic problem occurs

³ See particularly the November, 1937 issue of "Soil Conservation," U. S. Dept. of Agriculture, Washington, and Miscellaneous Publication No. 293, U. S. Dept. of Agriculture, Oct. 1937, entitled "Soil Conservation Districts for Erosion Control."

in the consideration of every proposal for government activity, whatever its nature. In the present case there are weighty considerations of policy on the side of providing for the program in national rather than in State legislation. We have seen that it is essential that erosion control operations be administered over watershed or other naturally bounded areas, without regard to the more or less arbitrary boundary lines of political units of government. Nature has divided the United States into 76 major drainage basins or watersheds. An excellent case can be made, therefore, for organizing each of these drainage basins into a single soil conservation district. Since nearly all these drainage basin boundary lines intersect State lines, the several States cannot by separate statutes organize these 76 districts. This follows from the established legal doctrine that the laws of each State have application only within its own boundaries. This important consideration of policy had to be decided on wholly different bases, however, because of the high likelihood that the courts would conclude that the proposed statute does not, as a matter of law, fall within the powers which Congress may exercise.

True it is that the Congress may spend public moneys to promote the general welfare and, hence, to finance erosion control operations.⁴ This it may certainly do upon Federal lands, and it may, even upon privately owned lands, to the extent that the landowner consents to the performance of such work on his lands. Since it is proposed, however, that the districts shall have authority to supplement financial assistance to farmers by enacting into law land-use regulations for erosion control to be binding upon all lands within the district, we must be able to point to some regulatory power in the Federal Government. The summary indicates that the only relevant regulatory power seems to be the power to regulate foreign and interstate commerce. The Supreme Court has held that the power to regulate interstate commerce includes the power to promote transportation and navigation.⁵ It may therefore well be argued that under the

⁴ This issue is examined as part of the discussion of the agricultural adjustment program to appear in a subsequent issue.

⁵ With few exceptions, no cases will be cited in this discussion, since this material is addressed primarily to non-lawyers. Those interested in case references on this

commerce power Congress may regulate private land use on the watersheds of navigable streams—since this land use will affect erosion and the erosion may interfere with transportation on the streams. There is so little material available in court decisions in this field, however, that this conclusion cannot be drawn with certainty. Moreover, it is necessary, in any event, that the land-use regulations of the districts be applicable to all erodible lands. Erosion is not confined to the watersheds of navigable streams. Since Congressional legislation would, hence, be of doubtful validity,⁶ and apply at best to only a part of the land area that needs treatment, it was decided that the statute should be drawn for State rather than Federal action. As we have seen, the States have inherent general governmental power, and the statute may therefore be enacted by the State legislatures—but it will be necessary to avoid violation of any of the limitations upon the exercise of State governmental power above listed.

The constitutionality of the State Soil Conservation Districts Laws has yet to be determined by the courts. Decisions of the United States Supreme Court and of the several State supreme courts indicate, however, the nature of the principal constitutional challenges that we may expect. It may be argued: That the enforcement of land-use regulations on private lands will deprive the owners of those lands of liberty and property without due process of law; that any State funds appropriated to finance the work of the districts, particularly to the extent that work is done with public money on private lands, are being expended for a “private” rather than a “public” purpose; that legislative power is being improperly delegated by the legislature to the State committee, to the district supervisors, and to the “land occupiers” who are to vote in the referenda; that the State is entering the

part of the material may consult a pamphlet published by the Department of Agriculture, 1936, entitled “A Standard State Soil Conservation Districts Law,” containing the text of the Standard Act and the opinion of the Solicitor for the Department on its constitutionality.

⁶ It should be noted that what is said in the text is limited to the question of the constitutional power of Congress to *regulate* private land use for the control of soil erosion. Where a Congressional enactment seeks to regulate land-use practices to the extent necessary to regulate commerce in agricultural commodities, an entirely different question is presented. That question will be touched upon in the discussion of the agricultural adjustment program.

forbidden field of constructing "works of internal improvement"; that the credit of the State is being lent or donated in aid of private persons; and that some provision of the State constitution, express or implied, prohibits the organization of new governmental subdivisions. Other limitations also may be urged, derived from either the Federal or the State constitutions, but this list includes the more important arguments.

(1) *Due Process and the Police Power*

Two quite well established constitutional doctrines are relevant on the question whether the proposed land-use regulations can be said to deprive landowners of "liberty" or "property" "without due process of law." On the one hand the guaranty of due process is held to protect the individual from interference by the State with the freedom with which he may carry on operations upon land he owns. On the other hand it is held that the guaranteed freedom is not absolute, and the State may regulate private land use (or other private conduct), where necessary to protect and promote the public health, safety, morals, or welfare. The last mentioned protective power is traditionally called the "police power."

On March 5, 1934, in its decision in the *Nebbia* case sustaining the New York milk price regulatory statute, the Supreme Court of the United States stated the relationship between due process and the police power most effectively.

"Under our form of government [said the Court], the use of property and the making of contracts are normally matters of private and not of public concern. The general rule is that both shall be free of governmental interference. But neither property rights nor contract rights are absolute; for government cannot exist if the citizen may at will use his property to the detriment of his fellows, or exercise his freedom of contract to work them harm. Equally fundamental with the private right is that of the public to regulate it in the common interest."

The Court then defined "due process," saying:

"And the guaranty of due process, as has often been held, demands only that the law shall not be unreasonable, arbitrary or capricious,

and that the means selected shall have a real and substantial relation to the object sought to be attained."

There is considerable learning to support the view that the guaranty of due process was never intended by the Constitutional Fathers⁷ to be applicable to the substantive content of legislation, but was intended to refer only to the procedures by which laws are adopted, administered, and judicially applied. This view would maintain that the idea that a law duly adopted, administered, and applied, may nevertheless be lacking in "due process of law" is a contradiction in terms. Whatever may be said of the soundness of that view, the above quoted extract reveals that it "has often been held" that a duly adopted statute will be deemed to be lacking in due process if it is "unreasonable, arbitrary or capricious," or if "the means selected" do not "have a real and substantial relation to the object sought to be attained." It should be apparent, without the argument's being labored, that words like reasonable, arbitrary, capricious, and substantial relation are terms without fixed content. They are variables which means different things to different people. What from one social point of view may be sweet reasonableness may from another be unreasonable and capricious. Nor does there exist a social calculus sufficiently exact to determine for all people what means have "substantial relation" to what objects.

In trying to guess, therefore, whether the courts will hold that the proposed land use regulations for erosion control are within the police power, or are outside that power because they are lacking in due process, we are trying to guess whether Federal and State Supreme Court judges will believe that such land use regulations are sufficiently necessary for the protection and promotion of the public health, safety, and welfare, that they are reasonable, not arbitrary or capricious, and bear a substantial relation to the goal of erosion control. We have two ways open to us for divining the ju-

⁷ While the due process clause of the fourteenth amendment to the Federal Constitution, which is binding on the State governments, did not become effective until 1868, the due process clause of the fifth amendment, binding on the Federal Government, was among the first ten submitted shortly after ratification of the Constitution, and became effective in 1791. The Supreme Court has held that the content of the two clauses (with exceptions not here relevant) is the same.

dicial mind in this way—an appeal to precedent and an appeal to reason.

In the past the courts have sustained various types of regulation of private land use as a proper exercise of the police power. They have held valid statutes designed to conserve natural resources (including the soil, fish and wildlife, gas and crude oil), to conserve the food supply, to prevent the spread of cattle and sheep diseases, to develop, reclaim, drain, and irrigate lands, and to protect the public water supply—on the ground that each, in its own way, would promote the general welfare. Among the regulations held valid for these reasons have been: prohibitions of the waste of gas and crude oil; a requirement that owners of forest land remove brush and debris likely to cause fires; the required destruction of trees to prevent spread of cedar rust, San Jose scale, the “yellows,” citrus diseases, and apple scab; the required destruction of wheat crops because of the presence of corn borers on cornstalks in wheat fields; the required dipping or slaughter of diseased sheep and cattle; and regulation of livestock grazing within 300 feet of streams feeding a municipal water supply.

On the other hand, some of the regulations which have been held invalid as involving a deprivation of property or liberty without due process include: prohibitions of the waste of natural gas, or of artesian well water; limitation of riparian water rights to those involving beneficial uses; prohibition of bathing by riparian owners in streams serving as sources of municipal water supply; limitations on diversion of surface waters; and limitations upon cotton production designed to maintain cotton prices.

Our appeal to precedent reveals that there exist competing analogies between which the courts are free to choose. But we may also appeal to reason. Experience has adequately demonstrated that uncontrolled soil erosion causes silting of stream channels, reservoirs and dams, loss of fertile soil material, overwash of rich lands by subsoil, silting of spawning beds, diminishing of underground water reserves, increase in speed and volume of rainfall runoff, and damage to highways, farm buildings, and other property in dust storms and floods. Erosion control is at one and the same time conservation of

natural resources and food supply, wildlife preservation, flood control, water conservation. It would seem necessarily to follow that it is the direct promotion of the health, safety, and welfare of the people—hence “reasonable,” “not arbitrary,” within the police power, and not a deprivation of property or liberty without “due process.” Whether the courts will so conclude it is too early to say.

(2) *Due Process and Public Purpose*

Under the Soil Conservation Districts Laws the districts will have power to build terraces and check-dams on private land, to contribute labor and materials to these operations, to lend or give the use of agricultural machinery and equipment as well as seeds and seedlings, and otherwise generally to assist private landowners to control erosion upon their lands. The purpose of this work is, of course, to make erosion control effective, but it cannot be denied that individual landowners will be receiving private benefit from such expenditure of the appropriations. It must be shown that these are not expenditures of public funds for private, but rather for public purposes.

The general rule seems to be that where the benefit to the individual is incidental to the object of achieving a benefit to the general public, the expenditure will be held to be for a “public purpose.” It is not easy, however, to predict whether the court will hold the private benefit to be merely incidental or to be the major object of the legislation in any particular case. Once again we may appeal to precedent and to reason.

Even more clearly than in the police power problem, the voice of precedent here blows both hot and cold. Expenditures for reclamation purposes involving loans to farmers have been held bad in some cases and valid in others. In land settlement programs where public funds have been appropriated to make loans to settlers, the benefit derived by the settlers has been considered merely incidental to the public welfare involved in opening up agricultural lands to cultivation. On the other hand, direct bounties to farmers and agricultural industries have been held unconstitutional as not being for a public purpose. The courts are divided on the related question of whether loans to farmers for purchasing

seed and for other relief purposes in times of emergency, are expenditures for a public purpose.⁸ General expenditures for the benefit of agriculture have in a few cases been upheld on the specific ground that they tend to preserve farm lands from erosion. The courts originally divided sharply on the question of the constitutional propriety of using public funds for the drainage of lands for agricultural purposes. Today, however, there is little tendency to deny the propriety of such appropriations. Similarly, the validity of expenditures for irrigation projects is established. In its recent decision sustaining the Alabama Unemployment Compensation Act, the United States Supreme Court said: "If the purpose is legitimate because public, it will not be defeated because the execution of it involves payments to individuals."

In this field, as in the field of the police power, there is considerable movement in the judicial decisions. Cases must be viewed, therefore, partly in the light of the year in which they were decided. To this point we shall return.

In the appeal to reason, we may urge that it is difficult to escape the conviction that since the present appropriations have for their object the control and prevention of soil erosion, the preservation of natural resources, the control of floods, the prevention of the impairment of dams and reservoirs, the preservation of wildlife, the protection of the tax base, and the promotion of the general health and welfare of the people, they are for a public purpose. It may be argued that the benefits received by individuals from operations upon their lands are incidental to these public benefits, precisely because the harm sustained by the public from uncontrolled erosion exceeds the decline in the value of agricultural lands which a single farmer may sustain from mining his soil and permitting his top soil to wash and blow away.

(3) *Delegation of Legislative Power*

The general rule is simple; its application to the concrete instance is frequently difficult. The courts say that the legislature may not delegate to others the power to legislate.

⁸ It should be remembered that we are here discussing the purposes for which State legislatures may make expenditures. The spending power of the Federal Government follows a somewhat different rule and will be discussed in the second installment of this article.

Inasmuch, however, as it is manifestly impossible for the legislature to anticipate every conceivable situation that will confront the administrative officers, and to define the rule to be applied to each situation, the general rule has come to be qualified as follows: The authority to prescribe administrative regulations to control application of the statute to particular instances, as well as the authority to determine their applicability in particular cases, may be delegated by the legislature to administrative officers, but the statute must contain specific "standards" to guide the administrative officers in formulating the regulations and determining their applicability.

Under the Soil Conservation Districts Laws it is necessary to decide whether a particular soil conservation district shall be established; how the boundaries of the district shall be defined; whether a particular district shall be continued or its affairs wound up; whether land use regulations shall be adopted; what the content of such regulations shall be; whether exceptions from the regulations shall be permitted; whether different regulations shall be made applicable to different lands. Each of these determinations must be admitted to be essentially "legislative," yet it would be folly for the legislature to attempt to determine these questions for each district and each farm, in the statute. Surveys must be made, technical facts accumulated and considered, public hearings held. The logic of the situation, therefore, compels the legislature to define the policy and to leave its effectuation to the executive branch of the Government.

It is a risk to attempt to determine from the legion of decided cases just what "standards" the courts will deem sufficiently explicit to guide and control administrative discretion. Where the court deems the standard sufficient, the delegation of legislative power is said to be "proper." Where the court deems the standard insufficient, the provision is invalid for "improper delegation of legislative power."

In the Standard Act, in determining where the boundaries of districts shall be laid, the State Committee is directed to consider topography, soil composition, erosion distribution, prevailing land use practices, relation of the proposed area to watersheds and agricultural regions, and other relevant

physical, geographic and economic factors. In determining whether particular districts shall be established, the Committee is directed to consider these same factors and, in addition, the attitudes of the land operators within the defined boundaries, the votes cast in an advisory referendum on the question, the proportion of votes cast to the number of eligible voters, the wealth and income of the land operators, the probable expense of the proposed operations, and other relevant economic and social factors. These standards are supplemented by a statutory direction that the Committee shall give due weight to the legislative determinations contained in the statute. These legislative determinations define the nature and causes of soil erosion, list the consequences of uncontrolled erosion, enumerate the appropriate corrective methods and declare the policy of the State to conserve the soil. On the question of discontinuance of districts, the Committee is directed to reconsider those factors that were originally required to be considered when the district was established, because circumstances may have changed since the original determination.

There is room for difference of opinion as to whether these "standards" are specific or general. Many cases have recognized, however, that legislatures cannot be asked to perform the impossible, and, hence, that where the legislature has been as specific as the nature of the circumstances will permit, the rule against improper delegation has been satisfied. There are, of course, cases where the courts have chosen to demand the impossible.⁹ The standards summarized above seem adequate in, however, the light of the general run of the decisions.

There is a further aspect of the rule prohibiting delegations of legislative power. The courts have held that legislatures may not delegate their legislative power even to the

⁹ A striking instance is a decision of the Illinois Supreme Court rendered in 1920. An Illinois statute authorized the State fire marshal, when he found "any building, or other structure which, for want of proper repair, or by reason of age and dilapidated condition, or for any cause, is especially liable to fire, and which is so situated as to endanger other buildings or property, or so occupied that fire would endanger persons or property therein," to order the removal or remedying of such building. A majority of the court, over the dissent of three judges, held that the statute failed to define adequately what buildings might be ordered removed or remedied. The discretion left with the State fire marshal, said the court, was an "arbitrary discretion."

people—who elect legislatures and make and amend constitutions. Therefore, a State statute which is to be submitted to a general referendum of the people in the State and is to go into effect only if approved by a majority vote in the referendum, is invalid, under the rule prevailing in all but a few States, as an improper delegation of legislative power to the people.¹⁰

Since it is a rare rule of constitutional law that does not know its exception, there is an exception to this rule as well, known as the "local option" exception. A number of court decisions have held that the legislature may authorize a referendum in a particular locality less than the whole of the State, to determine whether a declared statutory policy or program shall be effective in that locality. The exception seems to have originated in the liquor option cases. In many States the courts have not had occasion to determine whether the local option exception will be recognized. In other States the cases are in considerable confusion so that it is very difficult to ascertain what the rule of the State may be. In the Standard Act it was desired to submit to a referendum of the farmers the questions whether a district shall be created and whether particular land use regulations shall be adopted. This confusion in the decided cases, however, created a danger that these referenda would be held to be cases of improper delegation. This is the principal reason for the provision in the Standard Act that the referenda on these issues shall be merely advisory to the appropriate officers. It is provided, however, that the State Committee may not establish a district, and the district supervisors may not enact land use regulations into law, unless at least a majority of the votes cast in the respective referenda is in favor of such creation or enactment. The result is that the appropriate officers are not compelled to establish a district or enact land-use regulations even though a majority of the votes in the referenda have approved such action, but it is a condition precedent to their exercise of power to create or enact that a favorable majority vote shall have been registered.¹¹

¹⁰ A few State constitutions make special provision for "the initiative" and "the referendum" to permit direct popular participation in the legislative process. In the absence, however, of such express provision, the rule stated in the text applies.

¹¹ Just a word on a further delegation problem under the Standard Act. Recognizing that conditions differ sufficiently on different farms to make it likely that a strict

(4) *Equal Protection of the Laws*

Federal and State constitutions declare that no State may deny to any person "the equal protection of the laws." This is the principle of uniformity in legislation. By established rule the required uniformity is substantial rather than formal. All persons similarly situated—that is, of the same relevant class or circumstance—must be treated alike, but classification, with differential treatment by classes, is not prohibited. For tax purposes, the courts have adopted a more liberal rule of permissible classification than for regulatory purposes. But even in the latter case the legislative judgment as to the necessary classifications is not infrequently respected by the courts.

This problem is presented under the Standard Act chiefly in the case of the land use regulations which, as we have seen, must be flexibly adapted to varying physical conditions. The Standard Act therefore provides that the regulations shall be uniform throughout the district, except that the district supervisors may classify lands with reference to such factors as soil type, degree of slope, degree of erosion, and land use practices, and may provide regulations varying with the class of land, but uniform as to all lands within each class.

The variances from land-use regulations permitted by Boards of Adjustment, under the procedure discussed in connection with the "delegation" issue, may likewise be challenged as violating the uniformity requirement. Here again, validity of the permitted variation will depend on the existence of a necessity therefor strong enough to place the excepted lands in a class by themselves.

literal application of the provisions of land-use regulations to all farms may result in special instances of great practical difficulty or unnecessary hardship, the Standard Act provides for a board of adjustment for each district, with power to grant exceptions from land-use regulations upon appropriate showing in a public hearing. It taxes human ingenuity to attempt to formulate, in advance, a description of the types of conditions which may later arise to require such exceptions. The Standard Act has been unable to do more, therefore, than provide that the board may make such exceptions where necessary to relieve "great practical difficulties or unnecessary hardship," provided such exception "will not be contrary to the public interest" and will be "such that the spirit of the land-use regulations shall be observed, the public health, safety and welfare secured, and substantial justice done." Weasel words? Only if they are viewed unsympathetically. A substantially similar provision in a number of State urban zoning enabling acts was held to be a proper delegation by the courts of five States, and an improper delegation by those of two States. In these two, and perhaps in others, legislation adopted along the lines of the Standard Act will be compelled to omit provision for the board of adjustment.

(5) *Other Constitutional Limitations*

We may more briefly consider some other constitutional limitations. The limitations discussed are applicable in nearly all States. Additional limitations are prescribed, however, in some State constitutions. The constitutions of ten States prohibit either the State or governmental subdivisions, or both, from "engaging in works of internal improvement," or impose special conditions on such action. Originally introduced into the constitutions as a result of an unfortunate experience with squandering of public funds in aiding privately owned canals and railroads, the courts have expanded the limitation beyond its original purpose (although, it must be admitted, not beyond the usual meaning of the phrase) to make doubtful the validity of State highway programs, where not expressly authorized in the constitution, and even of State forest reserve programs. Particularly in Minnesota and in Kansas the courts at one time brought under this ban State programs for agricultural improvement and land development. Recent decisions, however, have cast doubt upon the status of some of these earlier cases. It is unlikely that the program of State participation in the construction of terraces and check-dams, and in modifying land use practices, for the control of erosion, will be deemed a forbidden work of internal improvement.

The constitutions of forty-five States forbid the State, or governmental subdivisions, or both, from lending or donating credit in aid of private enterprises. Were the soil conservation districts authorized to issue bonds, or were the State to provide for a special bond issue to finance the work of the districts, the programs of the Soil Conservation Districts Laws might run into this provision. Since these laws do not provide for such bond issues, it seems clear that no lending or donating of credit can be said to be involved in this authority. Some of these constitutional provisions, however, refer to lending or donating "credit or property." Funds in the State Treasury must be deemed to be State property. Furthermore, some State may seek to authorize a bond issue for this program. In such case the question will arise whether the lending or donation is made in aid of private persons. That question is closely related to the "public purpose" issue already discussed.

In two or three States the courts have advanced the idea that because the State constitution contains frequent references to counties, cities, towns and villages, it was the intent of the constitution to prohibit the legislature from providing for the organization of any governmental subdivisions other than those mentioned. In logic this is a clear *non sequitur*; in constitutional principle this is a violation of the rule that the State legislatures may exercise inherent general legislative power except as prohibited by some constitutional provision. No State court has yet definitely taken this position and it is unlikely that any will do so.

Similarly, the courts of four or five States have considered the idea that by virtue of some inherent principle of "natural law" the State legislature may not provide for the appointment of members of a local legislative body, but that such members must be made elective by the people of the locality. Here, again, no court has yet directly so held. The Standard Act and most of the State laws provide for a governing body of five supervisors for each district, of which three are to be elected by the farmers of the district and two are to be appointed by the State committee. It is thus sought to provide for democratic control over the governing board, while expert¹² participation in the deliberations of that body is made possible. It would be singularly unfortunate if the courts were to permit an imaginary constitutional limitation to prevent this experiment in combining the two methods of selecting local government officers.

It has not been the principal purpose of this discussion to champion the constitutionality of the State Soil Conservation Districts Laws. Those laws have been used, rather, as an illustration of the way in which Federal and State constitutional provisions come to play upon a land program, prescribe to a large extent what its administrative provisions must be, and create the institutional environment within which it must be made to operate. Nearly every one of the constitutional limitations discussed is applicable in greater or less degree to nearly every other State program dealing with the soil.

[To be concluded.]

¹² It will be recalled that the State Committee, which is empowered to appoint the two supervisors for each district, is itself a committee of technicians.

DOUBTS ABOUT STATISTICAL SUPPLY ANALYSIS¹

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THE purpose of the present paper is to emphasize again, by reference to the results of a specific research project, the two most fundamental difficulties which limit the possibilities of developing in economics precise empirical laws corresponding to those which are the pride of the simpler physical and biological sciences: first, the complexity of the phenomena with which our statistical analyses must deal; and second, the actual inconstancy over time of many of the basic relations with which our studies are concerned.² Although, as a result of the chastening experiences of the past eight years, the more competent price analysts have been led to qualify considerably the claims which had been made in the twenties for the merits of their methods, there is still a dangerous tendency for many who are less familiar with the problems involved to accept too uncritically the statistical results obtained. Since this tendency is attributable, in some measure at least, to the general practice of selecting for publication only those studies which yield high correlation coefficients, it should be salutary in the present instance to consider briefly a case of the opposite kind.

In 1933 one of the writers, following up Dr. Mordecai Ezekiel's earlier analysis of the milk production responses made by Vermont dairy farmers, obtained results which were completely at variance with those of the previous study.³ In both cases attempts had been made by multiple correlation methods to determine the relations existing between production changes in the State of Vermont and the milk-feed

¹ The statistical work upon which this paper is based was made possible by a grant for the purpose from the Committee on Research in the Social Sciences at Harvard University.

² A. C. Pigou, *Economics of Welfare* pp. 8-9.

³ Ezekiel, M. B. J. (and others) *Farmers' Responses to Price in the Production of Market Milk*, mimeographed report, U.S.D.A. Cassels, J. M., *A Study of Fluid Milk Prices*, Ch. XII. Added significance was given to this disagreement by the fact that Paul Quintus in an unpublished study made in 1933 at the University of Minnesota found a similar conflict between his results for a plant in the Twin Cities area and those obtained earlier for the period 1918-25 by Emil Rauchenstein.

price ratios prevailing at periods preceding the production changes by three months, twelve months and twenty-four months. The only material difference in the two studies was that the first one covered the period from 1919 to 1925 while the second covered the period from 1922 to 1931.⁴ The methods of analysis were almost identical and the data were substantially similar in character; yet no evidence could be found in the second study of the high correlation that had been apparent in the first. With linear regression lines fitted mathematically to data relating to winter season production alone, Ezekiel got a coefficient of determination of 0.790, whereas, in the later study the corresponding coefficient was only 0.034. From the earlier analysis it was concluded "that 79 per cent of the monthly variation in Vermont milk production from October through March were explained by previous changes in the milk-feed price ratio."⁵ In the subsequent study it was pointed out first, as a general logical objection to this conclusion, that the existence of this correlation does not by itself justify the inference that production changes were largely caused or explained by the preceding changes in the price ratio, and second, as an objection based on the statistical evidence, that the results subsequently obtained make it appear extremely doubtful if the causal relations between prices and production could possibly be as close as the original coefficients of determination had been taken to indicate.⁶ But it was recognized also to be highly probable that the causal relations are in fact much closer than a coefficient of 0.034 would suggest. Clearly, many problems were raised by this attempt to extend the original analysis to cover a later period and a further investigation of the various problems involved was definitely called for.

The Test Analyses

In the present study, to insure absolute comparability of the results obtained, entirely new analyses were made for the various periods and seasons concerned. The same series of

⁴ These dates refer to the production responses. Price data used in the analysis necessarily covered periods beginning in each case two years earlier.

⁵ Ezekiel *Op. Cit.*, p. 6.

⁶ Cassels *Op. Cit.*, p. 142.

basic data were used in all of the analyses and identical statistical procedures were employed.⁷ The short-cut graphic method of multiple correlation was employed and the analyses were simplified by the elimination of all transitional months and by the substitution of seasonal averages for the monthly figures that had been used in both of the earlier studies. (See table 1.) These latter modifications were felt to be desirable for the sake of simplicity in the analysis. Since the original purpose of separating the winter and summer analyses was to take account of the effects of the differences in the feeding practices prevalent at these different times of year, the elimination of those transitional months in which the basic distinctions would tend to be confused recommended itself as a natural refinement in the procedure. The months discarded were March, April, and May in the spring and October in the fall. Inquiries into the customary farming methods in Vermont indicate that, when allowances are made for the variation in weather conditions from year to year and the differences in conditions in different parts of the state, in these months a mixture of summer and winter dairying will commonly be found. The use of averages, November to February for the winter season and April to September for the summer,⁸ was suggested by the remarkable

⁷ The quantity series was one computed from figures in the biennial reports of the Vermont Department of Agriculture showing the monthly deliveries of milk and cream at dairy plants within the state by treating each gallon of 40 per cent cream as the equivalent of ten gallons of 4 per cent milk. The average butterfat test for all milk produced in Vermont is just slightly over 4 per cent. The milk price series was obtained by dividing these volume figures into the total value figures published in the same reports. Figures for milk production and prices (1917-31) were taken directly from Tables 30 and 31, pp. 262-263, of *A Study of Fluid Milk Prices*. Data introduced later for the years through 1935 were obtained from the same original source as those of the given tables and were computed in the same way. The feed price series used was the one prepared by Cornell University to represent the cost of a standard dairy ration at Utica, N. Y. It was chosen in preference to either of the New England series now available because it alone extends continuously from 1917 to 1935. Careful comparison of the New England and the Cornell index from 1921 revealed only minor differences in fluctuation, a consistent difference in level (the former is higher). In fact, preliminary investigations with the New England Milk Producers' Association index "computed" back to 1917 (by adding to the Cornell figure for each month the average difference between the two for corresponding months from 1921 on) gave analyses with results which differ only little from those discussed below. It was deemed best, however, not to use in the final results a series which in truth has no actuality.

⁸ Corresponding averages of the monthly milk-feed ratios were used. In the winter analysis a three-month average centered in October became the first independent variable. The average, April-June, played the corresponding role for the

uniformity in the seasonal patterns of the price and quantity series upon which the analyses are based. Because of this, whatever consistent and fundamental relations exist between monthly milk-feed price ratios and monthly production responses should be equally apparent between the seasonal averages for the series. On the other hand, just because of

TABLE 1. PRODUCTION AND MILK-FEED RATIO CORRELATION

Production		Milk-feed Ratios		
		Time advanced		
		3 mos.	12 mos.	24 mos.
Averages				
Year	x_1 Nov.-Feb.	x_2 Sept.-Nov.	x_3 Oct.-Mar.	x_4 Oct.-Mar.
1917	37,083 ¹			
1918	34,738	89.0	91.0 ²	
1919	40,479	111.0	91.3	91.0 ²
1920	45,896	103.0	113.5	91.3
1921	50,285	122.0	105.0	113.5
1922	58,556	144.0	127.5	105.0
1923	61,166	127.7	123.6	127.5
1924	61,522	119.0	125.0	123.6
1925	59,902	108.0	122.5	125.0
1926	58,519	133.3	109.3	122.5
1927	59,902	151.7	134.0	109.3
1928	59,427	135.3	145.2	134.0
1929	55,961	136.7	129.2	145.2
1930	63,159	135.7	133.0	129.2
1931	67,671	146.3	130.7	133.0

¹ Jan. and Feb. only.

² Jan. to March only.

uniformity in these seasonal variations, any statistical technique for removing them from the monthly data would tend to throw into undue prominence whatever divergences there actually happened to be. Since many of these divergences would undoubtedly be due to such factors as dates of fresh-

summer production from June to September. For the ratios to be advanced from earlier months, six-month averages were introduced. The "advances," it will be noted, are of approximately 3, 12, and 24 months. These intervals had been adopted in the Ezekiel study. Stewart M. Johnson, in a thesis, *Elasticity of the Milk Supply in Vermont*, presented at the University of Vermont, treats the production-price response of a selected group of producers from 1917 on. He has adapted intervals for his study by using the statistical criterion of a maximum coefficient and came out with advances which differ little from those of 3, 12, and 24 months used here.

ening, meat prices, temperature, and pasture conditions which are not reflected in the milk-feed price ratios of earlier periods the average will standardize the effects of these factors from month to month. Finally, on purely statistical grounds it was felt that the use of monthly data of such a pattern might increase deceptively the statistical measures of the reliability of the results obtained without increasing their actual validity.⁹

At this point a general statement may be made to explain the use made of linear regression lines in the present investigation. It must be recognized that the validity of the economic conclusions based on any correlation analysis depends upon the accuracy with which the regression lines represent laws of relationship which actually exist between the variables that are being studied, and further, that these true underlying relations will often (probably more often than not) be such that they could be much more accurately represented by curved regressions than by straight lines. Too often the fact is overlooked that the laws in question may be misrepresented by rectilinear regression lines just as others may be by curved lines. Our difficulty is, of course, that we do not know in advance the exact character of the laws that we undertake to investigate. In the present study preliminary experiments were made with curvilinear methods. In the analysis for the 1919-25 period no improvement in the fit could be made by the substitution of curves and no conclusive apriori reason could be found for regarding any particular curves as better representations of the basic relationships involved than straight lines. In the analysis for the period from 1922 to 1931, the only curves with which any positive correlation coefficients could be secured at all were logically so unsatisfactory that they could not be accepted. Here, it was true that the use of curves approximating simple parabolas yielded a coefficient of determination of 0.846, but the fact that in parts of the charts they were negatively

⁹ In this connection the following references are of interest: G. U. Yule, "Why Do We Sometimes get Nonsense Correlations between Time Series," *Journal of the Royal Statistical Society*, Jan., 1926; V. P. Timoshenko, "Wheat Prices and the World Market," *Cornell Memoir*, 118, p. 18; Alexander Sturges, "The Use of Correlation in Price Analysis," *Journal of Farm Economics*, Aug., 1937, pp. 704-705.

inclined, indicating that more favorable milk-feed price ratios would call forth smaller outputs of milk, warranted their rejection on logical grounds. Hence the problems of the present study will be discussed in terms of straight line relationships.

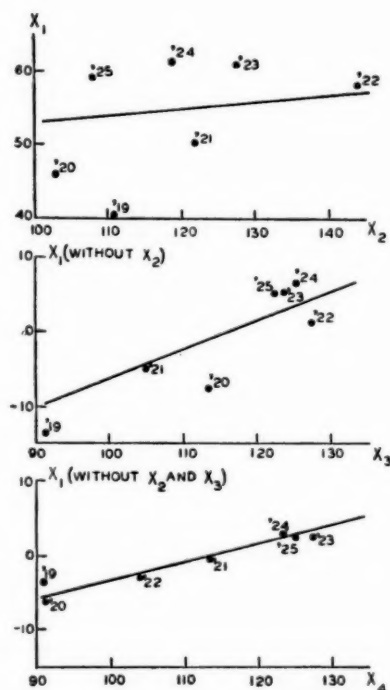


FIG 1. WINTER SEASONS, 1919-1925

In figure 1, production (x_1) is related to each of our three independent variables, the milk-feed price ratios advanced by three months (x_2), by twelve months (x_3), and by twenty-four months (x_4) respectively.¹⁰ The lines were obtained by successive approximations yielding the best fit, and the

¹⁰ For the (winter) entry of any one year, 1920 let us say, the variables are:

x_1 . . . productions, average, Nov. 1919-Feb. 1920,

x_2 . . . milk-feed price ratio, average, Sept.-Nov. 1919, (advanced about 3 months)

x_3 . . . milk-feed price ratio, average, Oct. 1918-Mar. 1919, (advanced about 12 months)

x_4 . . . milk-feed price ratio, average, Oct. 1917-Mar. 1918, (advanced about 24 months)

multiple coefficient is 0.993 with a determination of 98.6 per cent. This is an increase of some 19 per cent over that obtained by Dr. Ezekiel in his linear analysis for the same period.¹¹ We are confronted with a surface in which the milk-feed ratio of one year ago has the largest effect on production, while the ratio least advanced is represented as least influential. An increase of 10 units in x_2 accompanies a rise of less than 1,000,000 pounds in milk output, as against 3,900,000 pounds and 2,700,000 pounds for similar movements of x_3 and x_4 .¹² The possibility that the slopes of these lines have a diminished reliability owing to the existence of intercorrelations among the independent variables was investigated. Only the coefficient between x_3 and x_4 was appreciable ($\sqrt{x_3x_4} = .629$), while x_2 was practically unrelated to either of the others. .

The most significant thing to note is that the high determination obtained by Dr. Ezekiel was not only substantiated but actually increased. Despite the fact that Ezekiel's analysis, because of its use of monthly data, has more degrees of freedom (over 30), the present one has a coefficient which, even after correction for only three degrees of freedom, is much higher than his. The slopes of the regression lines, however, are quite different.

Using the data for the 1922-31 no surface with positive regression lines could be determined which would give a multiple coefficient greater than zero. The data fail to indicate any linear relation whatsoever. So, too, as was noted in the foregoing, they failed to indicate any logically acceptable curvilinear relations.

Certain of the questions which prompted this investigation may now be dismissed. Both of the earlier analyses have been tested. We are assured that the difference in the determination coefficients obtained for the two periods was the result of no error in either of the analyses, nor was it caused

¹¹ It should be added that a "best fit" curvilinear surface raised the determination of his analysis from 79 to 88 per cent. He gives no description of this surface and makes no use of it in his conclusions. In the present problem, it was already pointed out that the linear surface of Figure 1 fits better than any non-linear one.

¹² A summary of a book by Dr. M. S. Parsons, *Factors Affecting the Milk Supply in the New York Milk Shed*, as yet unpublished, indicates that for the state as a whole, the long-time response (one to three years) was more important than the short.

by the use of series which were not perfectly identical. We may turn our attention, therefore, to more fundamental matters, the nature of the underlying economic conditions characteristic of the years under consideration and the limitations of the statistical techniques employed.

Changes in Economic Conditions

To inquire rigorously into the economic differences between the two periods requires a qualitative as well as quantitative analysis. Certain hypotheses at once suggest themselves as explanations: the possibility that farmers are more responsive to upward price changes than to downward changes and that in the two periods different directions of change predominated; that farmers are sensitive to price changes of considerable magnitude, but insensitive to changes that are slight, and that the two periods differed in these respects; or that at different times farmers respond differently to similar price stimuli. These hypotheses we will consider in order.

In discussions of producer responses attention has been called to the irreversible nature of the phenomena.¹³ Response to a favorable movement in price will in general take a different path from that coming after an unfavorable move. The paucity of data in our periods would not permit the working of independent analyses for years in which the price ratio changes were all in one direction. One might expect the relationship to be more marked when responses are to be made to upward movements. Especially should this be true if the remoter price ratios have large effects on production, for these reflect more or less permanent changes such as in the size of herd, changes upon which the farmer cannot, or does not, readily recant. If the years from 1919-25 were characterized by a large number of such favorable movements, as compared with the 1922-31 period, we might thus explain part of the difference in results. Though too much emphasis should not be placed on percentages the base of which is small, the figures in table 2 are none the less sig-

¹³ See in particular, Cassels, J. M., Nature of Statistical Supply Curves, *Journal of Farm Economics*, April, 1933, pp. 378-87.

nificant. The direction of index changes in the earlier period is not very different from that in the later.

TABLE 2. PERCENTAGE OF UPWARD TO TOTAL MOVEMENTS

	1917-25	1921-31
	Percentage	
x_2	33	44
x_3	50	44
x_4	67	56

Next consider the possibility that responses are made only to changes of considerable magnitude in the price ratios. The farmer may be only casually affected by the relatively minor variations in the relation between milk prices and feed costs; if so, variations in output at such times could in no way be termed a response to our independent variables. On the other hand when these relative prices fluctuate extremely, he is likely to be keenly aware of them and his production policies consequently affected. But a comparison of the standard deviations of the independent variables does not reveal differences to which much significance could be attached. It is our belief that even where the divergence

TABLE 3. STANDARD DEVIATIONS OF PRICE RATIOS

	σx_2	σx_3	σx_4
1917-25	12.82	12.24	14.41
1921-31	12.32	8.80	11.11

is largest, in the price ratio one year removed (x_3), only a small part of the explanation of the variation in results may be found. The largest absolute changes in all the price ratios come in the second period.

Finally, although the fact would be difficult to prove and does not lend itself to statistical demonstration, it seems not unlikely that at a stage in the development of a dairy producing region when the industry is more or less in transition the responsiveness of farmers to price changes would be greater than at a later stage when production habits have

become more firmly established. In the case of Vermont the period from 1919 to 1925 was one of rapid expansion, as may be seen from figure 2. It was one also of shifting from butter production to fluid milk marketing. These changes would contribute to the flexibility of production programs. At this time many producers were still conscious of the possibility of making farm butter as a practical alternative to delivering milk to the nearest dairy plant, and since our figures relate to plant receipts this is a consideration not to be overlooked. From 1922 to 1931 the general level of output for Vermont was remarkably constant and the dairy industry had settled down into an established routine of production for the fluid market. Base rating plans had not been introduced, but production programs were undoubtedly influenced by considerations relating to market requirements which were not closely reflected in price changes. Dealers gave advice and instructions to their producers about the quantities they should deliver. Officers and field men of the cooperatives also used their influence to supplement or to offset the effects of price changes. For these reasons it might well be expected that the actual relations between milk-feed price ratios and production responses would be less close in the later period than in the earlier, although it would be strange if they had disappeared as completely as our correlation analysis would seem to indicate.

Statistical Deficiencies

Next we turn to consider the limitations of our statistical techniques when applied to the analysis of complex economic phenomena. It should be remembered that the process of sampling employed in the original analysis was one of taking what was at hand. To Ezekiel, data beyond 1925 were not available. Such a procedure, however necessary, gives no guarantee of the sample being representative, and still less of its being random in the universe under investigation. The data for that period may have been such as to contribute to the effect of the price ratios production changes which were actually unrelated to them. In the later period the presence of extraneous factors may have concealed the actual relations that did exist between prices and supply responses.

Some interesting light is thrown on these possibilities by an examination of production trends. In studying the data it was noted that with the high R for the early period there were large variations in production (as measured by σ). In fact, the standard deviation was more than twice that of the period, 1922-31. Plotting the data, as in figure 2, we see also,

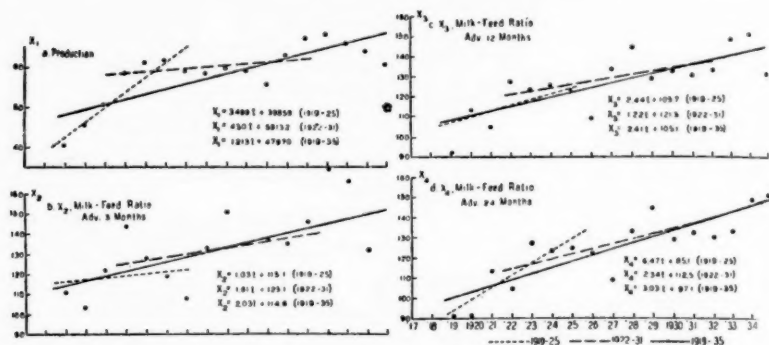


FIG. 2. WINTER SEASON TREND LINES

that these larger fluctuations accompany a decided upward movement in the series of production figures. A corresponding upward tendency is evident for all series of price ratios, though the difference between the periods is not nearly so marked. Using the technique of least squares, lines were fitted to each of the four sets of variables separately for the two periods under present discussion and also to the longer period, 1919-35. Especially noteworthy is the difference in slope for the production figures; that in the X_2 and X_3 lines it is not appreciable, though in X_4 we again note a large divergence. This comparison lends little support to the thesis that the upward trends in production are themselves evident because there is causal connection with the price ratios.

Elimination was accomplished by simple (arithmetic) subtraction of trend ordinate from actual observation.¹⁴ A winter season analysis with the new data for the earlier

¹⁴ A good argument for logarithmic subtraction in the case of price ratios can be advanced. For the sake of consistency with the entire procedure, which assumes additive relations, the present method was adopted.

period is presented in figure 3. Here the determination is 61.2 per cent as against the determination of 98.6 per cent with uncorrected data. The fact that the original figure was the higher by more than 37 per cent was owing to covariation

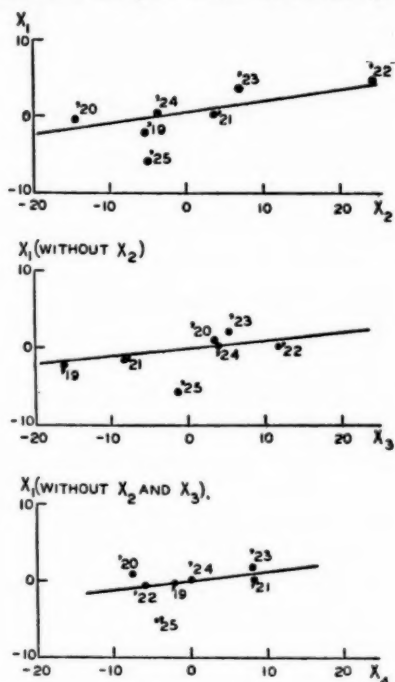


FIG. 3. WINTER SEASONS, 1919-1925 (TREND ELIMINATED)

along the trend lines; the removal of this percentage probably brings us closer to the true measure of the price-response relationship. The new statistical results, however, still do not prove that we have succeeded in correctly isolating and measuring the true function. The trend lines removed, for the most part, effects extraneous to our interest; but there is no assurance that the residuals do not contain many other effects not to be removed so simply. For the 1922-31 period, with or without trend, zero coefficients are invariably obtained. The regression lines of figure 3, it should be observed, have a different system of slopes from those in figure 1. Now X_2 represents the most

important element in variations of X_1 , while X_3 and X_4 have diminished importance. Whether or not this is logically more satisfying, it is at least true that from a statistical point of view these regressions are to be preferred. The intercorrelations among the independent variables have been largely removed with the trends; X_2 , X_3 , and X_4 are virtually independent.

Examination of the relative size of the standard deviations (trend removed) and of the relative intensity and direction of movement of the (corrected) price ratios, as before, failed to disclose appreciable differences. Could any information be obtained from a scrutiny of the price changes in milk and in grain separately? It is possible that the farmer reacts separately to price changes in these two commodities. He generally receives money for one at a time other than when he pays for the feed; contracts for grain at a price may be made for a season, subsequent changes may have a less marked influence; more generally, though grain costs play a large part in his money balance, they probably do not rank in the one-to-one relationship with milk prices that an unweighted ratio implies. An examination of the milk and grain series for the two periods reveals a striking difference which is completely concealed by the ratios. The milk series in the years from 1919 to 1925 had variations, as measured by σ , of 39 cents per hundredweight as against only 19 cents for the later period. For the feed prices, the corresponding figures were 49 cents as against 15. These differences, the only ones of a statistical character which our investigations could uncover between the periods, may possibly have contributed to some extent to divergence in the results obtained, but it does not seem likely that their importance was great.¹⁵

Conclusion

Having thus examined with some care the various explanations which suggest themselves to account for the conflicting results obtained from the statistical studies of these two periods we are finally led to conclusions which are dis-

¹⁵ Extensions of the study to cover the summer months and to deal with the entire period from 1919 to 1935 threw no new light on any of the problems under discussion.

tinctly disappointing from the statistical point of view. Economic processes are extremely complex and the analytical problems presented by them must often defy solution by any of the techniques which statisticians can devise. Considering the lengths of the periods covered, no more than the three independent variables could have been safely introduced into the analyses discussed. Yet it is evident that other factors must have exercised powerful influences upon the production responses of the Vermont farmers.¹⁶ Many would be factors incapable of treatment in statistical terms. In the earlier period these unrepresented factors apparently worked along with the milk-feed price ratios to produce effects consistent with what might have been expected if the price ratios had been solely responsible. During the later period they apparently operated in such a way as to offset any influence which was exercised by the factors specifically dealt with. In addition to this it seems probable that the actual responsiveness of the dairymen to price changes was greater in the first period than in the second. All of which considerations indicate clearly the need there is for the caution in accepting as significant economic laws the relationships obtained from any such statistical analyses as these.

¹⁶ Recent investigations by S. M. Johnson indicate that among these other factors the most important was probably the price of cows.

ECONOMIC ASPECTS OF LAND CONSERVATION¹

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MORE than other pressing issues which confront the land exploiting industries of the United States, the problems of land conservation^{1a} require close integration of the natural and the social sciences. The splendid progress in knowledge of the technology of land conservation should not obscure the importance of the social aspects in the causal complex in the effects and in the possible remedies of destructive exploitation.

Only a relatively small segment of these social aspects—that of economics—forms the topic of this discussion. Economics is confined to the analysis of individual actions and social systems of actions that make satisfaction of material human wants possible. The final origin of these wants is important and necessary for the economist to know but its analysis belongs to other fields of the social sciences. Progress towards desirable integration of the social sciences can better be made by broader training and more contacts of individual workers in different fields than by destroying the lines of demarkation between individual disciplines, clearly distinguishable if only from the point of view of scientific precision possible in them.

The writer has discussed the economic aspects of land conservation from the entrepreneurial viewpoint is, that is, from the standpoint of farm management in an earlier issue of this Journal.² Land utilization in general from this standpoint is governed by the "principle of optimum intensity." The optimum intensity or the most economical volume of input and output is reached at a point where the

¹ Giannini Foundation Paper No. 70.

^{1a} Land conservation as understood in this paper means not only protection of the quantity of the land, as for instance against erosion, but also protection of its quality, as for instance against the depletion of chemical nutrients or against the deterioration of texture and biological status. Quality is measured by the yield of crops and will be called "fertility." Fertility stands for the whole complex of external factors of plant growth. Compare: S. v. Ciriacy-Wantrup, "Soil Conservation in European Farm Management," *Journal of Farm Economics*, Vol. 20, No. 1, p. 87.

² *Op. cit.* p. 88.

value of the marginal unit of cost factors put into the land is equal to the value of the marginal unit of output from the land.

Optimum intensity thus defined takes account of the economic effects of any depletion of fertility traceable to the marginal increment in the volume of output. In other words, a decrease in the *present value* of future income caused by the marginal output is to be regarded as a part of marginal cost. But optimum intensity does not *always* require the maintenance of fertility. Only if the value of the marginal output equals or exceeds the costs of obtaining the crop *plus* the costs of restoring the fertility lost in obtaining the crop does land conservation become an economic possibility. The principle of optimum intensity does not, therefore, in itself imply land conservation. Quite the contrary. It means that in certain periods and in certain localities the maintenance of fertility was and is not only economically impossible but also socially undesirable. This must be the case if conservation diverts productive factors from fields in which the present value of their marginal product is higher.

It is held, that in agricultural production as well as in other industries "the maintenance of the plant is a necessity."³ While the costs of maintaining "the plant" are important before "the plant" is built or acquired, neither in agriculture nor in any other industry do costs of maintaining a fixed plant determine the most economical volume of output. The maintenance of fertility may be desirable for many reasons. But a clean differentiation should be made between farm management and other considerations.⁴

³ W. J. Roth, in the discussion of the cited paper, *Journal of Farm Economics*, v. 20, (1) p. 118.

⁴ Roth is of the opinion that our interpretation of optimum intensity neglects the aim of farm management for "a profit as *lasting* as possible" and the "idea of *continuous* operation." "Lasting profits" and "continuous operation" are phrases which refer to the constantly necessary decisions of the entrepreneur to apportion the factors of production between the creation of income flowing at the present time and at distant periods in the future. Economic theory postulates that the rate of interest in relation to expected returns—as far as the foresight of the individual goes—takes care for this apportionment. Thus, in the case of the individual farmers, the interest rate in relation to the value of the expected output from land use would determine the degree of intensity maintained for the purpose of land conservation. It is scarcely worth mentioning that land conservation in this respect differs only in degree but not in kind from other economic activities, most of which have implications of futurity.

At this point one important question must be asked: Even if the principle of optimum intensity—with due regard to prevailing interest rate and entrepreneurial time preference and foresight—determines the economic possibilities of land conservation for individual action, does it follow that this determination leads to desirable results for the whole economic system? We must inquire then whether the principle of optimum intensity and the alleged functions of interest rate and individual time preference and foresight are economically valid not only from the standpoint of the individual enterprise but from the standpoint of society as well.

It is obvious that the terms "input" or "costs" can have meaning in social economics only if they include all costs resulting from the use of a unit of land and not merely the costs of those individuals who happen to have a closer tenure relation than other members of the social group to the piece of land in question. It cannot be taken for granted that the indirect or "social" costs of land utilization will be taken into account with the direct or entrepreneurial costs as a matter of course. In some cases the individual does not appreciate the social costs involved because of ignorance. Moreover, in an individualistic society there is, *a priori*, no inducement for the individual to take into account social costs except the interaction of different opposing interests. The individual tries to transfer as large a proportion of costs as possible to the shoulders of other parties. If these are individuals or groups with equal economic power and foresight, their reaction will bring about an adjustment. Individual bargaining furnishes an elastic method of experiment to find a solution for the conflict of interests, not always in a form in which the optimal combinations of factors from the standpoint of the group is obtained but in a form in which human ignorance and egotism do the least damage. If the economic power and foresight of individuals are not equal, a condition which is the rule rather than the exception, some organized group action is necessary in order to avoid exploitation of one individual or group, by the other. Society should be concerned that every economic activity shall bear the full amount of social costs caused by that activity. Otherwise wasteful maldirection of resources will be the result. On the other side the activity of entrepreneurs

may also yield—as joint products—benefits to society which are not rewarded in the prices of their products or services. In such cases society should decide to help these groups of producers to bear the costs of these benefits. It would be an entirely mistaken policy to avoid the tracing of costs to their sources and merely to subsidize those on whose shoulders these costs finally rest. Similarly, it may be economical for society to subsidize entrepreneurs in order to obtain a larger amount of social benefits which are “joined” with a certain kind and volume of production and which otherwise would be supplied in smaller quantities or not at all. Society should bring pressure upon the individual at the point where economic decisions are made rather than wait until the decision is made and then—if at all—take purely defensive action. Only a class-minded and wasteful government would take the latter course.

Social costs are different from the complete sum of individual costs. They are the costs to society as a whole and do not replace but supplement individual costs. The specific meaning of social costs depends on the standards of accepted social values for a given society at a given time. A definition of the value standards of the social group in question must be the basis for determining the specific content of social costs. In a given society, standards of social value manifest themselves in the institutions of government and law, in custom, in public opinion, in religious and ethical rules. They are partly metaphysical, centering around concepts like “freedom,” “equality,” and “honor,” and lie beyond a purely economic analysis. It is scarcely necessary to say, however, that they are the most important realities in the conduct of social life. Society constantly makes choices between the costs involved in tolerating interference with social values and the costs involved in taking actions against interference.

The fact that the improvement in social cost accounting has lagged behind the improvement in business cost accounting is explained by the individualistic social philosophy of the past 200 years and by the difficulties of measuring social costs. Nevertheless, this measuring takes place constantly and the improvement of social cost accounting is one of the most urgent tasks of the social sciences. Society never has

acquiesced in the idea that social costs can be disregarded merely because they are difficult to measure in dollars and cents. If the present methods of business cost accounting are compared with the methods used by our fathers and grandfathers, the latter look crude to us. Future generations may look in the same way upon our present crude methods of social cost accounting.

At all times the land has occupied a conspicuous place in relation to the standards of social value. It would be interesting to analyze the attitudes of different societies towards the social cost incurred in utilizing the land. Such a study would reveal a great variation in attitudes toward, and computation of, social costs and could help to lay the institutional foundations of a far-sighted land conservation policy. Nevertheless the principle of apportioning and covering of social costs remains the same for any society. In fact it constitutes the most important principle for any land conservation policy.

Other aspects of social costs also are independent of the standards of social value. One can differentiate between different "grades" of social costs. They may be said to depend on the sensitiveness of society towards interference with these standards of value. Social costs may consist in actual damage and nuisance (disutility) to society—including the fact that a proportional share of public expenses is not borne—or in a less than optimal employment of resources (lack of full utility).

"*Damnum emergens*" and "*lucrum cessans*" have different aspects not from the theoretical standpoint but from the standpoint of practical policies. Most healthy societies would feel justified in combating actual damage and nuisance not only with education, demonstration, and subsidies but if necessary with strong regulatory controls. This may be done indirectly by taxation, by laws affecting land ownership, tenure, and inheritance, and by other means of agrarian policy. More direct approaches would be zoning, establishment of protection areas subject to certain land use regulations, government acquisition of land either outright or by condemnation, and last but not least by forming land conservation districts of public or semipublic character after the pattern of irrigation and drainage districts.

A less than optimal employment of resources on the other hand does not lend itself readily to strict governmental regulation. Differences of opinion as to optimal employment of resources will occur under any set of value-standards and the opinion of the government may not always be sound. Short cuts in education have thus far not demonstrated their superiority to the slower methods of improving the educational system and of increasing the sense of social responsibility among the members of the group. Furthermore, the most important social costs of land utilization fall into the class of "damnum emergens." To eliminate these costs constitutes a much more urgent task in a land conservation policy than the general planning and administrative action for the optimal utilization of resources. Whereas, great caution seems to be advisable if progress is to be made in the latter direction it must be stated bluntly that any society which fails to trace social costs consisting in damage and nuisance to their sources and to dispose of them by proper measures may be committing suicide. There are of course borderline cases between "damnum emergens" and "lucrum cessans" in the social sense, but the number of cases in which the situation is quite clear is so large that no time and efforts need to be wasted in trying to make elaborate distinctions which at the start have no practical importance.

This necessarily brief sketch of what is meant by "social costs" serves, nevertheless, to show that the principle of optimum intensity can not only be applied to individual enterprises but when properly interpreted, that is when social costs and social benefits are taken into account, is of significance for social economics as well. It remains to be seen, however, whether the optimum intensity for the sake of insuring future returns, practiced by the individual under the influence of the prevailing interest rate and his time preference and foresight, coincide with the degree of intensity most desirable for society in the interest of land conservation. It is clear on the basis of our previous discussion that this question is merely a special case of the relationships between entrepreneurial and social costs.

From the standpoint of social economics, the limits and the permanency of destructive exploitation are important.

The limit of destruction is often not the decrease of returns to a zero level. In the same way, as the return from land with increased units of input does not increase proportionally but in the form of an asymptotic curve which more and more slowly approaches but never reaches a maximum, so the decrease of the return from virgin land with increased time of exploitation proceeds rapidly at first and then more and more slowly and finally comes to a standstill. According to results of experiment stations in the Old and in the New World this stage of nearly stable returns is reached when the depletion of fertility, which is constantly lessened by decrease in harvest yields, comes to be offset by the accretions of plant food material which are set free by the natural process of weathering or obtained from the atmosphere. This would then be the maximum of exploitation possible. It may be termed the economic base level of exploitation. Any increase of crop yields or the stopping of the decrease of crop yields above this base level would mean increased input and would be determined by the equilibrium of marginal input and marginal returns.

However, under certain conditions destructive exploitation has not only carried returns to zero levels but has set in motion destructive forces which have wiped out "permanently" the possibility of growing plants under economic operations devised by man. Thus, not only the present but future generations are excluded from exploiting soil fertility. This has occurred not only in cases where slope facilitates and accelerates water erosion but where desert or semidesert climates induce wind erosion. Therefore, in order to establish the economic base level of exploitation, costs must be incurred. It is this "permanent" aspect of exploitation, the fact that the results of exploitation practiced during a period in which it conformed to economic rationality continue to make themselves felt for a long time and hence in a period in which the relative scarcity of land compared with human resources has changed, which constitutes the most interesting problem in land conservation from the standpoint of social economics. Since the "problem of futurity" plays such an important role in social economics, it might well serve as an example for an analysis of social and entrepreneurial cost

accounting. Such an analysis will show whether there are differences in the economic functions and the height of the interest rate and in the economic implications of the kind and degree of time preference and foresight between individuals and society.

The interest rate, like any price, is an essentially social phenomenon. In every social economy there is always, at least in the long run, an unlimited and highly elastic supply of alternative future incomes which can be realized through investment in income-yielding durable goods. Investments for the sake of land conservation fall precisely into this class and have to compete, therefore, with innumerable other opportunities. On the other hand there is a very limited and highly inelastic actual demand for such future incomes. This demand appears in the form of savings. One economic function of the interest rate is to balance this supply and demand through discounting of future incomes in order to avoid maldirection of savings. The interest rate eliminates investment opportunities in the order of their expected future return in relation to present costs, regardless of what their physical characteristics may be, until their total costs are in equilibrium with available savings. Investment in land conservation is no exception. Since savings are scarce in relation to the economies offered by durable goods in the production process in any kind of society, some form of interest rate will always appear in order to avoid their wastage. Even a socialistic economy would have to include interest charges in the pricing of durable goods although there would be no individual interest recipients. Thus, for an apportioning of savings the interest rate is "*conditio sine qua non*."

The same is true—and this is another function of the interest rate—in inducing permanent savings, that is savings above the short time accumulation of reserves which are to be consumed (dissaved) in a later part of life. Gustav Cassel has tried to show that the interest rate necessary is influenced among other factors considered later, by the length of the human life. According to Cassel in the modern Western World, the necessary rate at present amounts to 3 or 4 per cent. This particular rate is caused by the fact that those age groups which control the bulk of the wealth of society cannot

look forward to a life span of more than 25-35 years. They would not be induced to invest permanently if they would be better off by consuming their current and accumulated savings; in other words, they would not pay more than 25-35 years return to secure a perpetual annuity. It has been said that Cassel does not take into account the savings of impersonal corporations which in modern times contribute a very considerable part of savings. It is claimed that the supply of savings has thereby become independent from the decisions of capitalists. The creation of new corporations, however, depends still on the decisions of capitalists. Furthermore, there are many ways for capitalists to prevent the management of corporations from making savings against their will. If savings are made with the consent of capitalists, the otherwise existing supply of savings is not increased, of course. On the contrary, the internal saving of corporations often leads to uneconomic investments and to social wastage of capital which cannot remain without effect upon the interest rate. Besides, statistics show that the life span of modern corporations has not approached the longevity which is so often claimed for them. The same time limits apply to the great fortunes of those few income recipients who are said to be forced to save because of lack of spending opportunities. However, on the other hand, there is a large volume of savings which is comparatively independent from the existence of an interest rate. The desire for personal aggrandizement expressed in the striving for eternity of the name, of the family or of the social group, plays a much larger role in the savings of all social classes than Cassel thinks. The time preference of the community is influenced by the interplay of all these considerations. Under certain circumstances it may happen that at a zero or even at a negative rate dissaving is avoided. This point will be discussed later. Cassel's reasoning and his main conclusions have hardly lost all their value through this neglect. Even a socialistic society would have to find a way to justify before the members of the group, the sacrifices imposed upon the present generation for the sake of posterity, although this must not necessarily take the form of an interest rate.

It follows from what is said that not only the economic

function of the interest rate would be indispensable to society but that the height of the true or net interest rate which society has to figure in its own activities would be essentially the same as the height of the net interest rate for the individual. The gross interest rate which takes account of the "specific" or as Marshall calls them the "personal" risks has in history been higher or lower for society according to its stability. Since society has the possibility of spreading risks over the whole population, there is a tendency in some modern stable societies towards lower interest rates for the public than for individuals. This, in some cases, may justify differences in the investment in land, as well as in other durable goods, between society and individuals.

From his business standpoint the individual, as we know, regulates the input into the land—that is the intensity—for the sake of conservation, according to the prevailing interest rate, his own time preference and his expectation of future return. We may ask then whether the concern for the future is different in kind or degree between the individual and society. Are individual and collective time preferences and foresights the same?

It is not difficult to see why by every "Contrat Social" the concern for the future, among other functions, has been particularly delegated to society. The foresight of the individual ranges from near to nothing among primitive tribes in the tropics not exposed to the teachings of seasonal variations of climate, up to the individual life expectancy, as just described, and to the start of the next generation. Only rarely among societies whose standards of social value emphasize the uninterrupted sequence of generations within a distinctive social caste does the foresight of the individual reach over several generations. On the other hand, there are social goods which because of their very nature can be supplied only if a continuity of their supply, independent of the foresight of individuals, is guaranteed. These goods are, for example, religious and cultural development, education, public health, and the perpetuation of the entity of the group.

In the same way as the human body is more than the sum of its individual cells, the life of society is more than the sum

of the lives of its individual members. Social groups are not eternal, but a "religion" based on eternal life seems to be as necessary for the life of social groups as for the life of individuals.

For those who do not accept the notion of society as possessing an individuality of higher order, another approach may be offered. Every moment of time marks the beginning of a new generation. Since every new generation has the right to ask the same attention from the group as previous generations, group actions based on the "needs of the living" would have to be revised to a small extent at every moment of time. The integral of an infinite number of such small revisions represents the perpetuation of the group entity.

Defense is an important function in connection with the perpetuation of the group. Some aspects of the economics of land conservation can be treated as analogous to the economics of defense. People who do not question the necessity of sterilizing large amounts of natural resources for purposes of defense, complain if the attempt is made by far-sighted governments to sterilize a comparatively small amount of natural resources in the interest of land conservation. Losing land by physical destruction or by military defeat may have the same essential influence on national defense.

Thus a society might very well be justified in investing efforts for the conservation of land under conditions where interest rate and expected future returns would make it impossible for individuals to do so. But society should be perfectly clear and honest about the costs to the community. The true interest rate should be used always in computing these costs. In other words, social costs—for example interest charges—cannot and should not always determine social actions in the field of land conservation. But they should always be thoroughly explored and taken into account by those who make or approve government decisions. The gravest mistake would be the creation ad hoc of some sort of "cost free" land economics in order to make proposed actions appear economically desirable when they are not; although these actions may be of great social value from other aspects and may deserve consideration for that reason. The above distinction in the treatment of "damnum emergens" and of

"*lucrum cessans*" would be of importance for such investments of society from the standpoint of practical procedure.

One other economic aspect of land conservation must be mentioned. It was stated above that "there is always, at least in the long run, an unlimited and highly elastic supply of alternative future incomes which can be realized through investment in income-yielding durable goods." It was assumed, in other words, that all the available factors of production are employed and that savings are relatively scarce in relation to investment incentives. It is not necessary to elaborate the fact that this assumption does not hold true during shorter periods, for instance during certain phases of the business cycle. In addition, evidence is accumulating that there may have existed and may exist underemployment of the factors of production over longer periods. Under such conditions well-timed expenditures for land conservation may—among other public investments—be considered to utilize unemployed factors and to stop the vicious circle of decreasing investments, incomes, and prices.

AGRARIAN REORGANIZATION IN THE SOUTH

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THE chief aim of agrarian reorganization in the South is to remedy the following conditions: first, a relatively low standard of living, and second, a high rate of tenancy. It is obvious that there is some degree of mutual causation between these with the high rate of tenancy in part responsible for the low standard of living and the low standard of living in some degree responsible for the high rate of tenancy. However, the degree of reciprocal causation is often greatly overestimated. It is quite possible, indeed, that the ratio of tenancy in areas of higher standard of living may rise as high or higher than that in the South.¹

In the South, where the productivity of soil resources has been materially impaired, and where the ratio of labor to cultivated land is relatively high, the elimination of tenancy certainly would not of itself raise the standard of living. On the contrary, primary reliance for improving the standard of living in the rural South must be placed upon increased opportunity for employment in nonagricultural branches of the economy.

¹ It is interesting in this connection to point out that during the period 1930-35 the nominal rate of tenancy in the South has declined while for the rest of the United States the rate has risen. Even though the decline in tenancy in the South was apparently due to a statistical technicality, the increase for the rest of the country is significant. At the same time that the percentage of tenancy in the entire United States was almost stationary, at 42.4 per cent in 1930 and 42.1 per cent in 1935, there was a marked decline in the ratio of tenancy to ownership in Tennessee, Mississippi, Alabama, Arkansas, Louisiana, Oklahoma, Texas, North Carolina, South Carolina, Florida, and Georgia. The change in the ratio, however, seems to have been primarily caused by a decline in the status of sharecroppers to the status of laborers. In all these states, except Mississippi, the percentage of share croppers decreased while the number of owner operated farms increased. [In Mississippi there was an increase in the percentage of owner-operated farms, but a very small increase in the percentage of share croppers.] This in considerable degree was probably due to the efforts of landowners to obtain all government benefit payments under the cotton and tobacco contracts of the Agricultural Adjustment Act for themselves instead of having to give a small proportion of these payments to the share cropper. No part of benefit payments has to be given to laborers. This change in status moved croppers downward out of the tenant class.

To the extent that foreclosures in the corn and wheat belt moved owners downward they thus emerged into the tenant class and were counted by the census as such. There are few share croppers outside of the South and consequently there could be elsewhere no nominal reduction in tenancy from a decline in status.

Short of an unexpectedly large increase in the demand for domestic cotton or the discovery of some new kind of crop which is suited to the South and which is needed for industrial purposes it is not likely that the present agricultural population of the South will find employment in agriculture at returns which would measurably raise its standard of living. Reorganization of agriculture might ameliorate conditions somewhat, even under present circumstances, but only if industry absorbs a large part of what now amounts to a surplus rural labor supply. With this frank recognition of the limitations on results to be expected, the probable results of certain proposed forms of agrarian reorganization in the South may be examined.

Two principal solutions are offered. It is proposed, on the one hand, that some type of collective farms should be developed, and, on the other, that a system of small owner-operated farms should supersede the present tenant and share cropper types of organization. Sometimes it has been proposed that both of these types should be developed as a substitute for the present system of tenancy. In any case some form of governmental intervention is assumed in order to bring about the change.

The principal arguments advanced for the collective farm approach are: (1) it would solve the problem of training and supervising of the share cropper who would be helpless if simply given land and left to his own devices; (2) it is argued that the collective farm type of organization would lower cost of production on account of the advantages of large-scale production, particularly the wider application of machine methods to agriculture. Is there evidence, however, that the wider use of machinery in agriculture would lower costs? Certainly there is no positive evidence that it is likely to do so. The future development of the mechanical cotton picker, of course, might make it less expensive to produce cotton on large plantations compared with small farms, and provide a logical reason for shifting from smaller to larger production units. Unless the lower cost of production resulted in expanding the market for cotton, displacement of labor would be involved in such a shift, regardless of whether it took place through the extension of the large

privately owned and operated or the collective type of plantation.²

The problem becomes primarily a comparison of the efficiency of large scale production units in agriculture under private ownership and operation, with that of some collective type of ownership and operation. The experience of Soviet Russia appears to demonstrate the impracticability of a collective farm run upon the basis of an elected management responsible directly to farm laborers. The collective farm, if it is to be run at all, becomes a kind of state farm with an appointed and authoritative management. Consequently, the comparison becomes a specific one between state farms and privately owned and operated farms. It is doubtful that a state farm can be operated as cheaply as the average privately owned and operated farm, if the costs of the two are figured on a comparable basis. Such a comparable cost analysis involves computing an allowance for the rental value of the land, of course. If the state chooses to write off the rental value of the land or, in effect, to donate the rental value to the former tenants, this would keep nominal costs from appearing as high as they in reality are.

It is only fair to say that if state farms were actually established it is probable that the former share croppers would receive higher returns than they receive as tenants, as long as the government was willing to bear the expense. This means that at the present selling prices of cotton, a considerably higher subsidy by the government than that involved in charging off the value of the land would be necessary to pay the minimum wage which political pressure would probably insist be paid on a state farm.

The proposal for governmental aid to enable tenants to become owners of small farms holds much greater possibilities than does the proposal to establish collective farms. This proposal does not raise as sharply the problem of labor displacement as does the collective farm, although, as I shall show later, the problem is not absent even here. The development of the peasant proprietorship as a substitute for tenancy has, moreover, a long history which demonstrates its

² On the assumption of a completely socialized national economy the analysis would be materially altered.

practicability under some circumstances at least. Nearly all advanced European countries at some period in their history have put some similar kind of program into effect.

Nevertheless, most serious difficulties exist in putting such a program into operation in the United States, and too optimistic expectations in improvements in the standard of living of farmers participating in such a program must not be entertained. First of all, it seems necessary to face the question of just how one expects the standard of living to be improved by a simple change from tenancy to ownership. The share cropper or tenant now pays to the landowner a "rent" which consists partly of a profit (or loss) on account of risk, partly a return on capital (perhaps borrowed by the landowner from a bank or "furnish" merchant), partly a payment for management and sometimes an element that can only be listed under the head of "general exploitation." A mere change in form of tenure obviously does not eliminate the necessity for covering the greater part of each of these costs, except perhaps the last.

Even if one disregards the possibility of inflation of land values as the result of a government directed program of land acquisition for disposal to former share croppers and tenants, it is still true that the yearly payments to the government on account of interest on funds advanced for the purchase of land would approximate the cost of the "true" land rent paid by share croppers and tenants unless the government absorbed some or all of the cost of the land. Likewise, some form of supervision would have to replace that now exercised by the landlord. A not unimportant part of that supervision at present consists in essence of withholding enough of each year's produce from the share cropper, so that after deducting an interest item and a handling charge for the landlord, a sum is left to be advanced to the share cropper for the "furnish" during the next season. If land ownership were to be provided for the share cropper class, some agency would have, temporarily at least, to take over this combined supervising and furnishing function. Even if it were possible for the government to advance a year's "furnish" free, it is more than probable that the former share cropper would be unable to retain this small lump of essential circulating capital from

year to year. The pressure of his own miserably low income together with the almost irresistible pressure to buy, which in no small degree is the result of sales pressure directed primarily at the more fortunate classes of society, are most effective obstacles to the development of a true peasant economy of self sufficiency and thrift.

It is exceedingly difficult to compare the cost of the minimum amount of supervision which would be required under a program of small-farm ownership with that of supervision as now provided by the landowner. Supervision provided by some such agency as the Farm Security Administration or the Extension Service would encourage more scientific methods of cultivation and of crop rotation. On the other hand, it would be difficult to provide for anything like as intimate a degree of supervision as that now exercised by landlords over share croppers, except at heavy expense. To the degree that small landowners are recruited from the higher levels of tenancy where a greater sense of personal responsibility already exists, these difficulties would be somewhat obviated.

Probably the most serious problem involved is that of the amount of land which would be available for a program of elimination of tenancy. I do not refer now to the difficulties involved in the purchase of such land from the present owners. Difficult as this would be, some means no doubt could be found to solve the problems which would arise in this connection. The most serious problem arises in connection with the absolute supply of cultivable land. Any considerable improvement in the standard of living which might be hoped for as a result of the change from tenancy to land ownership would involve the production of more food and feed crops for home consumption. Such a change could not primarily be a shift in cultivation, however, since very little land could be transferred from cotton or tobacco production without a loss in income which would be scarcely compensated for, by the production of food, and forage crops. It is extremely doubtful whether the amount of land now cultivated by the average share cropper would be nearly adequate to raise feed for a cow, mule, chickens, and a hog or two in addition to the cash crops which would be

an absolute necessity if the farm unit were to be able to meet the minimum cash requirements for fertilizer, taxes, clothing, tools, and medicine.

It is perfectly true that if the way of life of the southern share cropper could be transformed into something more closely resembling that of the European peasant the seriousness of the problem would be somewhat alleviated. Peasant husbandry would reduce the need for artificial manures and waste land could be gradually improved and brought under cultivation. I repeat, however, that the development of this higher peasant standard of living would be possible only very gradually. In any case we cannot get away from the fact that a higher standard of living for share croppers is almost inevitably bound up with the problem of how to obtain a unit of land of adequate size upon which to place them. We might as well recognize that we cannot expect to provide neat cottages, with bathrooms, electric refrigerators, and radios, on the basis of the area of cultivatable land which is now available to the existing agricultural population of the South.

Once more we are confronted with the circumstance that the basic condition which is responsible for the low standard of living in southern agriculture is a too large agrarian population in relation to the quantity and fertility of land resources available. It is reduced to this apparent paradox: If outlets for population could be provided in industry for displaced labor, then a program of tenancy elimination through small holdings owned by the cultivator could be expected to improve the standard of living, since the size of the owner holdings could then be larger than the former allotment of the share cropper.

In spite of the very serious difficulties to be met in trying to replace tenancy with some form of small-farm ownership, some such program is to be heartily desired. Even with a rate of absorption of surplus population into industry which would remove the excess of agricultural labor which now exists, it would still be true that the system of agriculture in the South is intolerable as a permanent form of economic and social organization. A governmentally sponsored program of small-farm ownership offers the most hopeful avenue of attack on this system, even though it offers at best only a

partial solution to the problem of a surplus rural population.

A program of tenancy reduction through government sponsorship of small-farm ownership, however, if it is to be successful, would have to be worked out gradually and comprehensively. The cost to the prospective farm operator of the land and of working capital would have to be kept at a minimum, which means, among other things, that directly or indirectly part of the cost probably would have to be borne by the government. Unless a form of price fixing through the exercise of something like the principle of eminent domain were emphasized, only a gradual program of land purchase could avoid inflation of land values. Some device to limit the mortgaging or resale of land would need to be worked out. Exemptions from taxes or a differential rate of taxation in favor of the small-owner-operated farm might be desirable. Only the more thrifty and efficient of tenants and share croppers could be aided to acquire land during the first stages of the program if it were to have any prospect of success.

Gradually, some of the peasant's pride in the appearance of the dwelling and farm house, in the building up of the fertility of the soil, and in the passing on of an improved farm from father to son might be developed. The use of improved methods of cultivation would have to be taught. The diet would have to be improved by encouraging the growing of vegetables and the keeping of a cow. Co-operative marketing associations would have to be developed. All this would be the work of a generation at least. Although it would be impossible and undesirable to duplicate the standard of living of Western European peasants, if by means of a program of small-farm ownership the standard of living of those tenants who are share croppers could be raised as high as that of these peasants, very material progress would have occurred.

In summary, it appears that the collective farm offers no practicable solution to the problem of how to reduce tenancy and improve the standard of living of rural people in the South. The program encouraging the ownership of small holdings by former tenants and share croppers, on the contrary, has real possibilities, even if the problems which it entails are great.

Basically, substantial improvement in the standard of living depends primarily on factors outside of agriculture. This means that existing surplus agricultural labor must find employment either in expanded industry in the South or elsewhere. In view of existing industrial unemployment, this may seem a doctrine of despair. Whether it is or not depends upon the degree of progress which is made in the solution of the highly complex problem of purchasing power. The immediate prospect for the development of sufficient purchasing power to absorb the products of at least a part of those now unemployed is not a bright one. The economic future of southern agrarian population nevertheless depends largely upon how successfully this process develops.

NOTES

A NATIONAL AUDIT OF FARM OUTPUT NEEDED

Although farm statistics issued by the United States government bureaus rank high above all other countries, fundamental information is lacking in this country in one important field. This field consists of a condensation, grouping and analysis of material rather than of a collection of data.

In spite of all the given data and precise tabulation of fair estimates on acreage and yield, crops and marketing, price and storage, there is no attempt at a comprehensive annual account of how the total agricultural output of the country was disposed of or how that enormous amount of crude or semi-finished materials and their various by-products were utilized. If anyone wishes to know the total amount of meat, or pork, beef, veal, mutton, and poultry meat that was available or consumed in the United States, he is at a loss. The available information on cattle gives good estimates on shipments, farm slaughter (head and weight), the federally inspected slaughter, the stocks in cold storage warehouses and packing companies. But the most interesting questions are unasked and unanswered: how much meat that slaughter yielded approximately in every group of livestock, how much fat the slaughter yielded aside from meat, what per capita ratio that total yield of meat represented, how the carry-over affected the actual supply and how that supply was supplemented by imports or curtailed by exports.

The livestock statistics are no exception. Just the same lack of a comprehensive picture of the national market holds true for even such simple accounts as the utilization of the grain crop and the supply and consumption of bread or flour, or the use of grain for distilling and brewing.

Here and there, incoherent patches of such accounts are filled in. "Agricultural Statistics" contains a very detailed subdivision of the utilization of milk for a long list of purposes, mainly cheese varieties and condensed products. For corn, data are available for the wet grindings while no attempt is made to arrive at any estimate on the total human consumption and the proportion fed to animals or distilled.

There is no further need for elaboration to show what is missing. This lack is striking because in no country has the idea of "stabiliz-

ing" agricultural markets and planning supply and storage as a means to influence the price been discussed for a longer period or with more emphasis than in the United States. After the operations of the Federal Farm Board and the AAA, and after all the efforts to enlighten the public and the farmer about the functioning of the agricultural commodity markets, there still exists no annual national balance sheet of actual consumption. For research and information of the public as well as for any plans at interventions, the account in question is a necessary presupposition. Dictatorial countries like Germany and Italy have had such accounts for a long time and use them as the basis of their regulation of the markets. In a democratic country they ought to be more urgently needed because the agricultural policy requires the public consent. How can the usual discussion on "surpluses" reach solid ground without tables on the supply and demand of the consumer at hand?

Perhaps some part of the missing utilization account exists in nuce somewhere in the desks of AAA officials or of the commodity experts of the Bureau of Agricultural Economics. Even though this may be assumed for some commodities like cotton, tobacco, milk, and perhaps wheat, but may be doubted for commodities like meat. Even if the desks of somebody would contain all of this information these accounts would not mean much, because they would not be available to the public in general nor to those employed in research, teaching, or business.

Few of the possible objections that may be raised with reference to the technical possibility of computing and calculating the missing national account can ultimately be defended. It is true that such an account requires a large amount of estimates; the same is true for all agricultural statistics. The tabulating machine that operates so precisely cannot deceive us about the character of all agricultural production "statistics." They are almost altogether based on estimates, though with certain more or less reliable checks. The same procedure has to be applied to the utilization account. What really might be a temporary obstacle are the holes in the basic statistics on consumption in its various stages through the processing industries down to the real consumer. In view of the existing scarcity of data and of the obstacles there is no excuse for blocking the progress by an exaggerated call for maximum results. It would be unreasonable to begin the work with calculating everything down to calories and complicating it by calculating the

money value in addition to the physical account. Such additions may be made once every five or ten years.

The national account ought to be a special chapter within the volume of agricultural statistics. The account should contain for each group of commodities of the crude products and their processed derivatives, complete tables of the domestic output, the net import, or net export, the stocks at the beginning and the end of the year, and the actual domestic consumption for food, feed and technical purposes. Commodity groups should be: the grains, the meats and animal fats, milk and dairy products, fibre plants and oilseeds, tobacco, vegetables, fruits and nuts, hides and skins. By-products or joint products like bran, skim milk, or cotton seed should also be traced and accounted for to their final disappearance.

After initial handicaps the technique of computing the total account should operate smoothly. With accruing experience in watching and checking the results and with improving cooperation from the side of private industries (such as slaughtering, packing, flour milling, brewing, and distilling), all of which are much interested in such an enterprise, national auditing on the disposal of the ten billion dollar farm output will become more precise.

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SERIAL OR COHERENT CORRELATION IN PRICE SERIES

Most of the statistical formulas that have been developed require that the data be a random sample and also that any one observation in the data be independent of any other observation or observations. In economic data, such as a time series of prices, this latter prerequisite of independence is not usually fulfilled. The data necessarily refer to a continuous series of years where the price one year is affected more or less by the prices in preceding years. The correlation between the price one year and the price the next is usually significant when tested by means of the usual methods of testing ordinary correlation coefficients. The correlation between u_s and u_{s+1} is r_1 , between u_s and u_{s+2} is r_2 etc., where u_s is the value of the variable (e.g., price) in the year s . Yule¹ defines serial correlation:

¹ *J.R.S.S.*, vol. 89, 1926.

Given r_1

$$r_2 = r_1^2$$

$$r_3 = r_1^3$$

$$r_4 = r_1^4$$

Although there is some relationship between neighboring observations of a price series, it has been suspected that there is no serial correlation (as defined by Yule).

Four commodities from each of five groups (grains, fruits, poultry and dairy, meat animals, and miscellaneous) were used in this note. For each commodity the correlation coefficients r_1 , r_2 , r_3 , and r_4 have been calculated. These are given in table 1. Weighted average yearly farm prices were used for 27 years, the period for which the data were available. For 15 of the 20 commodities r_4 is negative; for 6, r_3 is negative. Yule's definition has no place for negative correlation coefficients, and certainly this is too large a proportion to be due to sampling errors. Also, there is a significant negative r_4 for beef cattle.

TABLE 1. CORRELATION COEFFICIENTS

Commodity	r_1	r_2	r_3	r_4
Grains:				
wheat	.8201	.5157	.1999	-.0521
corn	.6508	.2607	-.0754	-.2087
oats	.6052	.3061	.0943	-.0890
barley	.5480	.3532	.0833	-.2048
Fruits:				
apples	.5273	.5054	.1661	.0330
oranges	.6038	.4761	.1636	-.2714
grapefruit	.3442	.3836	-.1512	-.1414
pears	.8518	.6402	.4208	.1705
Poultry and dairy:				
milk	.8307	.5090	.1928	-.0636
butterfat	.8229	.5129	.2262	-.0219
chickens	.8777	.6385	.3587	.1018
eggs	.7698	.4482	.1635	-.0887
Meat animals:				
beef cattle	.7626	.2999	-.1631	-.4841
calves	.8043	.4030	-.0276	-.3746
lambs	.8167	.5251	.2046	-.0755
hogs	.7499	.3211	-.0326	-.2569
Miscellaneous:				
potatoes	.3809	.1819	.0720	.0208
tobacco	.6904	.3444	.0114	-.1077
flaxseed	.6440	.2310	-.0297	-.1772
cotton	.6771	.3858	.1722	.2046
Significant values of r for $P = .05$.381	.388	.396	.404

We assume the hypothesis that Yule's definition of serial correlation applies to price series.

These calculated correlation coefficients were compared with the hypothetical serial correlation coefficients (using square, cube, and fourth power of r_1) by means of transforming the various r 's to their corresponding z values (Fisher's z), calculating the differences between the actual z and its corresponding hypothetical value, and obtaining the probabilities of as great, or greater, differences occurring.

Theoretically, these probabilities should be distributed evenly in a rectangular distribution over the range from $P = .00$ to $P = 1.00$ for each type of commodity and also for the entire group of 60 comparisons.

TABLE 2. DISTRIBUTION OF PROBABILITIES

P^*	Grains	Fruits	Poultry and dairy products	Meat animals	Miscellaneous	Grains and fruits
.50-.99	4	4	0	0	5	8
.00-.49	8	8	12	12	7	16
Probability of deviation from a rectangular distribution**	.1937	.1937	.0002	.0002	.3871	.0756
P^*	All commodities combined					
	Actual frequency	Theoretical frequency	Chi square			
.75-.99	9	15	2.400			
.50-.74	4	15	8.067			
.25-.49	10	15	1.667			
.00-.24	37	15	32.267			
	60	60	44.401 for which $P < .0001$			

* Probability of a difference between the actual and hypothetical correlation coefficients as great or greater than the difference obtained.

** These probabilities obtained from expansion of binomial $(p+q)^n$ where $p=q=\frac{1}{2}$ and $n=12$. This was used because numbers were not large enough to make use of the Chi square test.

Table 2 shows the actual distributions of these probabilities for each group of commodities as well as for the combined total of all commodities. The lower row of probabilities shows whether or not there has been any significant deviation from the theoretical rectangular distribution. If these probabilities are below the usually accepted fiducial limit of $P = .05$, there is significant disagreement.

Yule's definition of serial correlation definitely does not apply to the commodities used in two of the groups—meat animals and poultry and dairy products. This is demonstrated in table 2 where the probability was calculated to be two chances in ten thousand. It might apply to the three other groups—grains, fruits, and miscellaneous.

All commodities combined have a probability of less than one in ten thousand. Apparently there is a great difference between the price series of livestock and poultry and those of harvested crops, so one cannot be thoroughly justified in combining them. Taking grains and fruits together results in a probability of .0756. It is doubtful if serial correlation applies even to these commodities.

Eugen Slutsky in his article on "Summation of Random Causes as the Source of Cyclic Processes"² has called such correlation coefficients as have been used in this note coherent correlations. He believes price series to be the result of a moving summation with weights of one kind or another. He states, "because the consequences (observations) possess causes in common, there appears between them a correlation even though the series of causes are incoherent." Using $(n-1)$ as the number of causes that two adjacent observations have in common, he gives the following formulas for coherent correlations if all the weights are equal (simple moving summation):

$$r_0 = 1 \qquad r_1 = r_{-1} = \frac{n-1}{n} \qquad r_2 = r_{-2} = \frac{n-2}{n} .$$

Substituting the calculated values of r_1 , r_2 , r_3 , and r_4 for the same 20 price series in the formulas given by Slutsky, values of n were calculated. These exhibit very little internal uniformity for the various commodities. However as the distribution and standard error of " n " were not given, this tendency for non-uniformity of n for a single commodity can be seen only by inspection. Even if proof could be given, it would only indicate that the price series might be the result of a moving summation of causes whose weights were not equal and that these simple formulas could not be applied.

The conclusions of this note are: (1) that Yule's definition of serial correlation cannot be applied to the price series of at least two commodity groups used here—that no serial correlation (ac-

² *Econometrica*, vol. 5 (2), 1937.

according to the Yule interpretation) exists; (2) that nothing can be definitely stated as to whether there is coherent correlation in its simplest form, although there seems to be a slight indication that this, too, does not exist. There is some relationship between prices for successive years, but these simple formulas as given by Yule and Slutsky do not seem to apply to price series in general. Apparently they do not hold the solution to the question: "How can the observations of a time series be made independent of each other?" A great deal has been written on the analysis of time series and trend analysis. Very little, however, has dealt with the problem of using the ordinary methods of finding relationships between two or more series of non-independent observations—such ordinary methods as correlation, regression, or analysis of variance and their respective significance tests. Must new formulas or methods be developed to meet these needs?

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RELIEF DATA AS CRITERIA OF SUBMARGINALITY¹

This article attempts to state and test hypotheses, some of which have been assumed by research groups. The general hypothesis is that relief data may be used profitably as criteria of submarginality. This assumption may be broken down into three propositions: (1) Relief data may be employed as criteria of submarginal land areas, (2) Relief data may be used to locate persons who are submarginal economically because of insufficient capital or equipment or skill in farm management; (3) Relief data are useful as criteria of the culturally submarginal man in the agricultural enterprise.

The following paragraphs present data in support of these propositions.

I

To my knowledge the first major use of emergency relief data as criteria of submarginal land² areas was made by the Division of Research and Statistics of the Federal Emergency Relief Administration in 1934. Six problem areas were selected on the basis of

¹ Published as scientific paper number 362, College of Agriculture, Experiment Station, State College of Washington.

² By submarginal land is meant land which is so poor that it cannot provide its present population with a decent standard of living under average conditions of management when employed in its most productive capacity.

relief data. These were the Lake States Cut-Over Region, the Appalachian-Ozark Area, the Short Grass-Spring Wheat Area, the Short Grass-Winter Wheat Area, the Western Cotton Area, and the Eastern Cotton Belt. Upon investigation each of the areas was found to be homogeneous, not only from the standpoint of a high relief load, but also of a complex of geographical, economic, social and general cultural factors which produced the relief situation.³ These six areas have had high relief loads up to the present time.⁴ Relief density maps, therefore, revealed areas with persistent problems growing out of the maladjustments of man to the natural resources.

Gordon W. Blackwell studied certain North Carolina rural localities with 20 per cent or more of their families on relief and found evidences of maladjustment to the land.

Professor Olaf. F. Larson, studying areas of high relief loads in Colorado, concludes that the highest relief rates and the worst land areas go together.⁵

In South Dakota,⁶ in Wyoming,⁷ in Texas⁸ and in Tennessee⁹ the results of the studies indicated that the relief rates were high in less productive areas such as those having waste land, wind erosion, inadequate water supply, or low soil fertility.

Studies of rural counties in the State of Washington indicate quite clearly that rural relief very frequently reflects maladjustments in man's relationship to the basic natural resources of the community.¹⁰

The one serious danger in using relief data as criteria of sub-marginal areas is that since the relief program has been semi-

³ The results of the study are published as research monograph No. 1 of the FERA by Beck and Forster, entitled "Six Rural Problem Areas, Relief—Resources—Rehabilitation," 1935.

⁴ See monthly maps issued by the Federal Emergency Relief Administration entitled, "Distribution of Relief Families."

⁵ "Rural Relief and Agricultural Adjustment," Proceedings of the Western Farm Econ. Assn., 1936, pp. 50-63.

⁶ Stewart, H. L., The Agricultural Situation in the Intensive Livestock Production Area of Southeastern South Dakota, Resettlement Administration Bul. K-11, Dec., 1935.

⁷ Stewart, H. L., Natural and Economic Factors Affecting Rural Rehabilitation in Southeastern Wyoming, R. A. Bul. K-13, March, 1937.

⁸ Pevehouse, H. M., Natural and Economic Factors Which affect Rural Rehabilitation on the North Plains of Texas, R. A. Bul. K-5, July, 1936.

⁹ Allred, C. E. et al., Rural Relief and Rehabilitation Possibilities in Williamson County, Tennessee, Co-op. Bul. No. 13, May 20, 1936.

¹⁰ Landis and Forschmiedt, Causes and Consequences, A Study of Rural Relief in Relation to County Backgrounds, mimeographed, Rural Sociology Research Laboratory, Pullman, Washington, 1936.

political or at least administered semi-politically, policies of local relief administrations, rather than underlying agricultural conditions, may be responsible in certain cases for high relief loads. To do away with or at least to modify the effect of administrative policy on relief loads, the person using relief data to locate submarginal areas should select as large a homogeneous area as possible and follow the relief trend for as long a time as possible. The longer the period of time covered the more reliable the relief data will be as criteria.

II

Relief data may be used as criteria to locate individuals who are economically submarginal¹¹ because of insufficient capital, equipment, or skill in farm management.

During the summer of 1934 the writer participated in a federal study which compared relief families with their non-relief neighbors.¹² Case was matched with case in the rural community where each lived. The study indicated that the farmers with small acreages, especially in wheat growing areas, tended to be on relief. According to studies by the Farm Management specialists at the South Dakota State Agricultural College the most successful farm in the wheat raising section was a large acreage unit.¹³ Relief clients were found to possess less livestock and poultry than their non-relief neighbors. Sound farm management called for the raising of livestock in addition to grain farming.¹⁴ A nation-wide study of a similar nature showed comparable results.¹⁵

A graphic bulletin of the Federal Emergency Relief Administration, *On Relief*, dealing with relief in the United States as of May, 1935, portrays strikingly (Chart XIX) differences between relief and non-relief groups in ownership of cows, hogs and poultry, and size of farms. Those on relief had less livestock and poultry and

¹¹ A submarginal person as used herein is one who is living on an economic and social plane which is insufficient to provide the minimum necessities for physical and cultural well-being as measured by the standards of his community.

¹² Landis, Paul H., Rural Relief in South Dakota, S. D. Ag. Exp. Sta. Bul. No. 289, 1934.

¹³ Hampson and Christophersen, Estimated Returns from Farms of Large, Medium and Small Size of Business in the Spring Wheat Area of South Dakota; Estimated Returns from Operating 800 Acres in the Spring Wheat Area Under Different Plans, S. D. Ag. Exp. Sta. Circulars Nos. 20 and 21 respectively, May, 1934.

¹⁴ Hampson and Christophersen, op. cit.

¹⁵ McCormick, T. C., Rural Households, Relief and Non-Relief, Monograph No. 2, Division of Social Research, WPA, p. 2.

the median acreage of those on relief was 93; of those not on relief, 119. Olaf F. Larson studying the relation of size of farm to relief in Colorado¹⁶ finds that farmers on relief operate farms only one third to one half the size of those operated by their neighbors. Many other bulletins and reports similarly indicate that relief and rehabilitation clients have smaller farms and less livestock than the average in the respective localities covered.¹⁷ Most of these same bulletins give evidence that the relief group has less farm machinery and fewer gardens than the non-relief group, and an abnormally high indebtedness in relation to property values.

The evidence consistently supports the conclusion that those who operated smaller than average farms and who had less than the average number of workstock, milk cows, poultry, and who had no garden tended to be on relief rolls. Workstock proportioned to farm needs undoubtedly makes for efficiency in farm operation. The raising of cows and poultry and a garden make for more effective self-maintenance. The farmer who failed to practice the principles of farm management, for whatever reason, tended to appear on relief rolls when the crisis came. The question might well be investigated as to whether some of the farm management practices which help make farmers self-sufficient in times of crisis are the better practices at all times. It is, of course, possible, that the opposite might be true. It may be that in normal times extreme specialization is more profitable than the types of diversification which seem to have kept farmers off relief during the depression. The question is an important one in the face of trends toward subsistence farming brought about by resettlement and rural rehabilitation activities.

III

The final hypothesis is that relief data are criteria of the culturally submarginal¹⁸ man in agriculture. A considerable number of studies have been made of the characteristics of rural relief

¹⁶ *Ibid.* p. 55.

¹⁷ Among those presenting evidence are the K series published by the R. A. in cooperation with the U. S. D. A. and W. P. A. Each of the following bulletins in the series presents data on size of farm and each supports the conclusion stated above: K-1, Sherman Co., Neb.; K-2, Hyde Co, S. D.; K-3, Perkins Co., Neb.; K-4, Hettinger Co., N. D.; K-7, Divide Co., N. D.; K-8 Sheridan Co., N. D.; K-10, Curry Co., N. M.; K-11, Moody Co., S. D.; K-12, Hale Co., Tex.; K-13, Goshen Co., Wyo. Another series by C. A. Allred and staff supporting this hypothesis was published during 1936 by the Tennessee Ag. Exp. Sta. in cooperation with the W. P. A. and the Tennessee Welfare Commission.

¹⁸ The same definition of submarginal man is used as in Part II.

households.¹⁹ Most of these studies compare the rural relief group with the total rural population or match rural relief with rural non-relief groups in the same community. These studies indicate that relief families are submarginal in income and employment. For example, relief farm labor families in the Yakima Valley, Washington, had an average annual income of \$294 whereas, the non-relief group received \$585.²⁰ The relief group had 24 weeks of employment per year; the non-relief group, 44.7 weeks.²¹ A sample of relief and non-relief farm operators and rural villagers in South Dakota were compared. During their employment history since accepting their first job, a greater percentage of the relief group had experienced unemployment.²² A federal study of a similar nature involving 47 counties in 19 states²³ revealed that during the first four years of the depression (November 11, 1929, through October 31, 1933), the male heads of relief households, had been unemployed 2.5 as many times as non-relief heads in the same community.²⁴

The relief population is submarginal in educational training. Both national and state studies show that heads and wives of rural relief households have less schooling than their non-relief neighbors. The older children of relief households who have completed their schooling, also have less training than the children of their non-relief neighbors.²⁵ Especially significant in its bearing on educational status of rural relief families is a study by Hummel, Eure, and Bennett made in the state of Virginia.²⁶ They find that 71 per cent of children of relief households, between the ages of 10 and 17 are retarded in school, and that a lower percentage of the relief than the non-relief group are in school, especially after passing the age of compulsory attendance. They find also that among the relief group a higher percentage have never attended school. Ac-

¹⁹ Chief among these is *Rural Households, Relief and Non-Relief*, op. cit.; *Rural Relief in South Dakota*, op. cit.

²⁰ Landis, Pritchard and Brooks, *Rural Emergency Relief in Washington*, Wash. Ag. Exp. Sta. Bul. No. 334, 1936, p. 34. See also Landis and Brooks, *Farm Labor in the Yakima Valley, Washington*, Bul. No. 343, 1936, pp. 54-56.

²¹ *Ibid.*

²² *Rural Relief in South Dakota*, op. cit. pp. 30-31.

²³ *Rural Households, Relief and Non-Relief*, op. cit., p. 3.

²⁴ These latter comparisons include villagers, although the differences appear when farmers are isolated from the total sample.

²⁵ See Landis, Paul H., *Rural Relief in South Dakota*, op. cit., pp. 25-26; Landis, Paul H., Pritchard, Mae, and Brooks, Melvin, op. cit. pp. 36-38 and McCormick, op. cit. pp. 33-34.

²⁶ *Education of Persons in Rural Relief Households in Virginia, 1935*, Virginia Polytechnic Institute, January, 1937.

cording to their report, retardation of the relief group is induced largely by delay in entering school, failure to pass grades, irregular attendance, and prolonged absences. A Tennessee study²⁷ reports similar findings.

The rural relief group is submarginal in standards of living. During the spring of 1934 in South Dakota a comparison of a rural relief group with their non-relief neighbors revealed that a much higher percentage of the non-relief group owned automobiles, radios, and telephones. The non-relief group subscribed to daily and other newspapers and magazines in a much greater percentage of cases.²⁸ Whether the differences were induced by the depression or whether they existed before is unknown.

The relief group is submarginal in stability. They tend in a greater proportion of cases to be "rolling stones," moving from community to community and changing from occupation to occupation more frequently than their neighbors. Several state and federal studies dealing with characteristics of rural relief households support this generalization.²⁹

A number of studies show that relatively more recent comers to the rural community are on relief than of the longer time residents. Here may be cited Bulletin Number 14 of the Tennessee Series and K-1 of the Resettlement Series, which indicate that a relatively large number of the relief group began residence or began farming operations during the past period of submarginal yields and low farm earnings. K-8 shows that relatively recent comers are on relief in a greater proportion of cases, nearly half of the relief clients having been in the county less than ten years. A series of bulletins published by the California State Relief Administration³⁰ indicate that a relatively high proportion of more recent residents are on relief in nine different counties. There are some exceptions, however, to this generalization. A study in Hyde County, South Dakota (K-2) shows an abnormally high proportion of long-time residents on relief. Two California counties, Madera and Humboldt, have a large proportion of long-time residents on relief.³¹

²⁷ Allred and Roskopf, *Educational Status of Rural Relief Families in Tennessee*, Tenn. Ag. Exp. Sta., Nov. 15, 1936.

²⁸ *Rural Relief in South Dakota*, *op. cit.*, pp. 48-51.

²⁹ *Op. cit.*

³⁰ This series of reports by Robert E. Rapp deals with "The Economic Problem of Rural Relief in California with Special Reference to Selected Counties." Each report deals with a separate county for the year 1936. The series is numbered 1 through 11.

³¹ *Op. cit.*

Available evidence in a great number of state and federal studies indicates that the relief households have more children of dependent ages than the non-relief households, even though they are less able to support them.³²

Do these traits (low income, unemployment, lack of education, low standard of living, mobility, larger than average number of dependent children)³³ indicate submarginality in culture and standard of living? Practically all of the above traits are usually considered undesirable to some degree according to the current scale of social values. Since rural relief has been of an emergency character, we can say with confidence that many of the recipients of relief are not submarginal as measured by these standards, yet the relief group as a class possesses the characteristics listed above in greater degree than their non-relief neighbors.

Without question relief has singled out to some extent the submarginal family in the agricultural enterprise. Because of the extensive distribution of relief given during the emergency period little stigma has been attached to receiving relief. The relief group has not been singled out as a separate social class, nor is it recognized as submarginal. This is desirable, for there is less tendency for them to think of themselves as inferior than would be true if their group considered them inferior. Even at best many have no doubt been pauperized.

The development of the rural relief group as a permanent submarginal class is the most serious threat to rural democracy that exists today, for it may well be that the continuance of public relief in rural communities will make for such social stratification as has not previously existed. It would be unfortunate indeed if rural society in the United States should become stratified on the basis of self-sufficiency vs. dependency.

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³² Most previous citations present evidence on this topic. See also Hummel, B. L., Eure, W. W., and Bennett, C. G., *Composition of Rural Relief Households in Virginia, June and October, 1935*, Virginia Polytechnic Institute, August, 1936; Landis, Paul H., *Farmers and Villagers on Relief, Washington State, June, 1935*, mimeographed, Rural Sociology Research Laboratory, Pullman, Wash., pp. 10-12.

³³ It may be seriously questioned whether a larger number of dependent children in the relief household is an index of submarginality, or of social undesirability. A high birth rate with closely spaced children, accompanied by relative poverty, is usually considered an accompaniment of a low standard of living and a low level of general culture. On the other hand, our highly competitive society may ultimately be driven, in the interest of population numbers, to the point of aiding sub-

SOME THEORETICAL ASPECTS OF CONTROLLED MARKETING¹

Controlling the flow of agricultural commodities to market² has become of tremendous importance; hence theoretical studies of this very practical problem are urgently needed. This note establishes for the producer a theoretical basis for replacing uncontrolled shipments to market by a controlled flow, whether by voluntary cooperation, state prorate law, or federal marketing agreement. Three possible goals for a program of control of the flow of goods to market are (1) maintenance of a constant price, (2) maximum income to growers, and (3) holding shipments at the same amount for each unit of time. The accomplishment of one of these objectives may or may not result in one or both of the others. In this paper, we determine the shipments which maximize the returns to growers under carefully stated hypotheses.³

The practice of controlling the flow to market appeals to many men actually engaged in the distribution and sale of farm produce. Their experience has taught them to avoid a demoralized market which sometimes results from the activities of many independent individuals shipping without knowledge of, or regard for the amount of the commodity being put on the market by other shippers. Consumers, once accustomed to an extremely low price, resist a rise to a higher profitable level. Many jobbers, wholesalers and retailers prefer to handle those commodities whose supply is steady and certain. However, the belief of the man in the business does not always agree with economic theory; so it is desirable to investigate controlled marketing from a theoretical viewpoint.

stantially the family that is willing to assume the responsibility of children. Our relief policy which has tended to favor somewhat the family with dependents is one mild step toward state aid of parenthood.

¹ The encouragement and suggestions of H. R. Tolley, Administrator of the Agricultural Adjustment Administration, have materially aided the author in preparing this paper. A brief description of the assumptions and methods of this article was included in a paper, *Mathematics in Economics*, presented at the Western Farm Economics Association, Laramie, Wyoming, July 30, 1936.

² For a general discussion of the subject of farmer cooperatives controlling the flow to market, see John D. Black and H. Bruce Price, *Cooperative Central Marketing Organization*. Univ. of Minn. Agr. Exp. Sta. Bul. 211, pp. 53-60, April 1924.

³ For an interesting article that is concerned primarily with the application of the principle that equal marginal net returns from all markets gives a maximum income for marketing a given supply, see Frederick V. Waugh, *The Controlled Distribution of a Crop Among Independent Markets*, *The Quarterly Journal of Economics*, No. LI, Vol. 1, pp. 1-41, November 1936.

In this study we are only interested in the regulation of the flow to market, so we consider the total supply as known and fixed. Expressing this in symbols we have

$$(1) \quad \begin{aligned} \dot{u}(t_0) &= 0, \\ u(t_1) &= k; \end{aligned}$$

where $\dot{u}(t)$ is the total amount shipped during time t_0 to t , while t_0 and t_1 , represent the times at which shipments begin and end respectively, and k is the total supply available for shipments during the season.

As this control of shipments appears to be particularly important in the case of perishable commodities, it is appropriate to assume that the goods are not stored in the receiving market but are sold during the same unit of time (say a week or month) in which they are received. In order to include those cases where the commodities are shipped some distance to market, we consider a time lag T between the shipping date and sale date; that is

$$(2) \quad u(t) = y(t + T),$$

where $u(t)$ is the derivative of $u(t)$ with respect to time (i.e., shipments per unit time) and $y(t)$ is the demand or quantity sold per unit of time. If the individual or board which controls the shipments is interested in only one market, this lag T is the average length of time between shipments and sales for this one market and it may take any positive value or even be zero if the market is right at hand or the commodity is sold and then immediately shipped. However, if the control extends to several markets, the lag T is some kind of weighted average of the different lengths of time between shipments and sales in these several markets.

The exact theoretical demand curve for a given commodity cannot be known, because the amount of a commodity sold in a period of time depends on many factors. However, it is often assumed that the demand curve may be approximated, within the range of interest, by a straight line,

$$y(t) = ap(t) + b, \quad a < 0, \quad b > 0.$$

Here $p(t)$ is the price of the commodity, which may vary with time; but a and b are constants. Agricultural economists often assume that a demand curve has different positions at different times, but that it always remains parallel to its previous positions.

There are objections to this assumption, but it is probably more realistic than a demand curve that remains fixed through time. This moving demand curve may be obtained by letting b in our equation of a straight line be a function of t and thus we have

$$(3) \quad y(t) = ap(t) + b(t), \quad a < 0, \quad b(t) > 0.$$

Now we must consider the cost of shipping these commodities to market. Let us assume that the cost per unit time is proportional to the shipments during this unit of time, except for an added fixed cost for overhead; that is

$$(4) \quad q(t) = c\dot{u}(t) + d,$$

where $q(t)$ is the cost per unit time, and c and d are positive constants. The symbol c includes such costs as freight and d includes administrative costs.

The profit per unit time, $\pi(t)$, may now be expressed as

$$(5) \quad \pi(t) = p(t)y(t) - q(t).$$

However, we wish to maximize the total returns to growers over the whole shipping season, t_0 to t_1 . This leads to a problem in the calculus of variations;⁴ that is, we must choose $u(t)$ so as to maximize

$$(6) \quad \pi(t_0 t_1) = \int_{t_0}^{t_1} \pi(t) dt,$$

subject to the hypotheses (1), (2), (3) and (4).

By use of (2), (3) and (4), we express $\pi(t_0 t_1)$ in terms of $\dot{u}(t)$

$$(7) \quad \pi(t_0 t_1) = \int_{t_0}^{t_1} \left\{ \left[\frac{\dot{u}(t - T) - b(t)}{a} \right] \dot{u}(t - T) - c\dot{u}(t) - d \right\} dt;$$

but integrating the last two terms and recalling (1), we have

$$(8) \quad \pi(t_0, t_1) = \frac{1}{a} \int_{t_0}^{t_1} \{ [\dot{u}(t - T)]^2 - b(t)\dot{u}(t - T) \} dt - ck - d(t_1 - t_0).$$

As the last two expressions are constant and a is negative, $\pi(t_0 t_1)$ will be a maximum when

⁴ For other examples of the application of the calculus of variations to economic problems, see Evans, *Economics and the Calculus of Variations*, Proc. Nat. Aca. Sci. vol. 2, Jan. 1925; also see Evans, *Mathematical Introduction to Economics*, New York 1930, Chaps. XIV, XV.

$$(9) \quad \bar{\pi}(t_0, t_1) = \int_{t_0}^{t_1} \{ [\dot{u}(t - T)]^2 - b(t)\dot{u}(t - T) \} dt$$

is a minimum, subject of course to the boundary conditions,

$$(10) \quad \begin{aligned} u(t_0) &= 0 \\ u(t_1) &= k. \end{aligned}$$

Euler's equation⁵ which the function, $u(t)$, must satisfy, if it minimizes $\bar{\pi}(t_0, t_1)$ for a given $b(t)$, is

$$\frac{d}{dt} \{ 2u(t - T) - b(t) \} = 0.$$

Hence it follows that

$$\dot{u}(t - T) = \frac{b(t)}{2} + c_1;$$

in order to obtain the expression for the shipments per unit time at time t , we replace t by $t + T$ which gives

$$\dot{u}(t) = \frac{b(t + T)}{2} + c_1.$$

Integrating this with respect to t , we have

$$(11) \quad u(t) = \int_{t_0}^t \frac{b(t + T)}{2} dt + c_1 t + c_2.$$

The boundary conditions (10), require that

$$\begin{aligned} u(t_0) &= c_1 t_0 + c_2 = 0 \\ u(t_1) &= \int_{t_0}^{t_1} \frac{b(t + T)}{2} dt + c_1 t_1 + c_2 = k. \end{aligned}$$

Solving these for c_1 and c_2 , we have

$$\begin{aligned} c_1 &= \frac{k - \int_{t_0}^{t_1} \frac{b(t + T)}{2} dt}{t_1 - t_0} \\ c_2 &= -c_1 t_0. \end{aligned}$$

⁵ J. Hadamard, *Lecons Sur Le Calcul Des Variations*, Paris, 1910, page 67.

Substituting these values in (11), we obtain the expression for the total amount shipped between the beginning of the shipping season and any later time; that is,

$$(12) \quad u(t) = \int_{t_0}^t \frac{b(t+T)}{2} dt + \frac{k - \int_{t_0}^{t_1} \frac{b(t+T)}{2} dt}{t_1 - t_0} t - \frac{k - \int_{t_0}^{t_1} \frac{b(t+T)}{2} dt}{t_1 - t_0} t_0.$$

Differentiation of (12) with respect to t gives

$$(13) \quad \dot{u}(t) = \frac{b(t+T)}{2} + \frac{k - \int_{t_0}^{t_1} \frac{b(t+T)}{2} dt}{t_1 - t_0}.$$

The last term may look rather complicated, but it is a constant for any given function $b(t)$. Hence, in order to maximize returns, shipments must increase or decrease from one period to the next just half as much as the demand curve in (3) will rise or fall after a time lag T . If the time lag is ignored or is zero, we have merely that the shipments must increase or decrease half as fast as the demand curve rises or falls. It is important to notice that this result is independent of a , the slope of the demand curve.

Let us analyze equation (13) more thoroughly, keeping in mind that it is based on assumptions (1), (2), (3), and (4). It is well

known that $\frac{b(t+T)}{2}$ is the amount of shipments per unit of time

at time t which will maximize selling value when there are no restrictions on the amount of the commodity available for sale; so

$\int_{t_0}^{t_1} \frac{b(t+T)}{2} dt$ is the season's total shipments which will maximize

the season's total selling value when there are no restrictions on the amount available for sale. Hence the numerator of the last term in equation (13) is the difference between the total amount which was assumed in (1) would be sold during the season and the amount which would maximize the season's total selling value. (This is equivalent to maximizing grower returns for the season under our

assumptions, because we found in equation (8) that total cost for the season is a constant.) This difference is of course positive, zero, or negative as k is greater than, equal to, or less than the amount which will maximize the total selling value for the season. When this difference is divided by the total length of the shipping season ($t_1 - t_0$), we have simply the average amount of this difference per unit of time. It is interesting to notice, and perhaps it was to be expected a priori, that equation (13) merely adds the average amount of this difference to the amount of shipments which would maximize the selling value per unit of time at time t , if there were no restrictions on the amount available for sale. Briefly but less accurately: the influence of the surplus or deficit of the commodity is spread uniformly throughout the season.

We may easily specialize this to the case of a fixed straight line demand curve by letting $b(t) = \bar{b}$, a constant. This gives

$$(14) \quad \dot{u}(t) = \frac{k}{t_1 - t_0};$$

so under this assumption, returns are a maximum when shipments per unit time are held constant throughout the shipping season.*

In order to determine the price during the period of time (t_0 t_1), we substitute the expression for $\dot{u}(t)$ given by (13) into (3), recalling the assumption (2). This gives

$$(15) \quad p(t) = -\frac{b(t)}{2a} + \frac{k - \int_{t_0}^{t_1} \frac{b(t+T)}{2} dt}{a(t_1 - t_0)}.$$

* If we wish to generalize our problem and consider the slope of our demand as varying with time, equation (3) is replaced by $y(t) = a(t)p(t) + b(t)$ with $a(t) < 0$ and $b(t) > 0$. In this case, returns are maximized when

$$(A) \quad \dot{u}(t) = \frac{b(t+T)}{2} + \frac{K - \int_{t_0}^{t_1} \frac{b(t+T)}{2} dt}{\int_{t_0}^{t_1} a(t+T) dt} a(t+T);$$

from which it follows that

$$p(t) = -\frac{b(t)}{2a(t)} + \frac{K - \int_{t_0}^{t_1} \frac{b(t+T)}{2} dt}{\int_{t_0}^{t_1} a(t+T) dt}$$

Perhaps it should be mentioned that the result in (13) is obtained directly from (A) by considering $a(t)$ as a constant, and the result in (14) follows from holding both $a(t)$ and $b(t)$ constant in (A).

Hence the price varies directly with $b(t)$; so the maintenance of a fixed price (under our assumptions) is incompatible with the maximizing of grower returns except when the demand curve remains fixed throughout the season. In this special case the price is constant and

$$(16) \quad p(t) = \frac{k}{a(t_1 - t_0)} - \frac{\bar{b}}{a}.$$

In order to apply this theory to a specific marketing program, it would be necessary to determine values for k , t_0 , t_1 , and $b(t)$ over the interval $t_0 + T$, $t_1 + T$. Estimates for k , the total supply that will be available for shipments during the season, have often been made by control boards in their operation of marketing programs. The beginning and end of the season (t_0 and t_1) also can be approximated easily by men experienced in handling the particular commodity whose shipments are to be controlled. Hence, the only problem which would require any special ability or technical skill is the determination of the form of the function $b(t)$ from $t_0 + T$ to $t_1 + T$. However, this does not appear to be more difficult than other statistical problems with which the agricultural economist is now working.

This theory may be stated in another form which is probably more suitable for the use of a control board, especially if the time lag between shipments and sales is so small that it may be considered as zero, or be ignored. Let t_j be any time between t_0 and t_1 , then t_{j+1} is one unit of time later. By using equations (2) and (3), we obtain an expression for the change in shipments from one period to the next; that is

$$(17) \quad \dot{u}(t_{j+1}) - \dot{u}(t_j) = a[p(t_{j+1} + T) - p(t_j + T)] \\ + b(t_{j+1} + T) - b(t_j + T);$$

on the other hand, from equation (13), we have

$$(18) \quad b(t_{j+1} + T) - b(t_j + T) = 2[\dot{u}(t_{j+1}) - \dot{u}(t_j)].$$

Eliminating the difference, $b(t_{j+1} + T) - b(t_j + T)$, from equations (17) and (18), we obtain the relation between the change in price and the change in shipments between two consecutive periods,

$$(19) \quad \dot{u}(t_{j+1}) - \dot{u}(t_j) = -a[p(t_{j+1} + T) - p(t_j + T)].$$

When translated this means: *to maximize returns, under the assumptions stated, and when demand is increasing, the shipments must be increased to the point where the increase in shipments will be $-a$ times as much as the price increase at the time they are sold. To maximize returns, if the demand is decreasing, the shipments must be decreased to the point where the decrease in shipments will be $-a$ times as much as the price decrease at the time they are sold. It should be pointed out that this result is independent of the function $b(t)$; but depends on a knowledge of a , the slope of our demand curve, which may be less to determine. This result will probably be fairly easy to apply to actual circumstances if the time lag between the date of shipments and date of sale is very small, or ignored.*

In order to illustrate the use of the result in equation (19), let us set up a hypothetical illustration. We have found that the demand for lemons is approximately a straight line, which rises in warm weather and falls in cool weather, but it moves parallel to its previous position (i.e. it satisfies hypothesis (3)). By means of a statistical analysis, the slope of the demand curve has been determined roughly as a decrease in sales of 1,000 boxes per month for an increase of one cent in the price of a box; that is, $-a$ equals 1,000. For the purpose of simplifying this word description, let us consider the time lag between shipments and sales as sufficiently small in comparison with the unit of time (a month) for which shipping policy is to be determined, that this lag may be ignored.

The statistical analysis that was used in determining the slope of the demand curve also enables us to fix the shipments for the first month of the season which would satisfy equation (13). In order to be concrete, let us say that this first month is May and that 700,000 boxes were shipped at an average price of \$3.60 per box. In June the demand for lemons has increased so that a larger quantity can be sold at a higher price. By observation of the market it appears that shipments of 900,000 boxes during June will bring an average price of \$3.65 a box. These shipments are excessive because the increase in shipments is 200,000 boxes, the left hand side of equation (19); but the right hand side of equation (19), $-a$ multiplied by the increase in price, is only 5,000 boxes. After estimating the price at which different shipments can be sold, we fix 775,000 boxes as the proper amount to ship; these are expected to bring an average price of \$4.35 a box. Equation (19) is satisfied because the increase in shipments is 75,000 boxes and

—a times the increase in price ($1,000 \times 75$) is also 75,000 boxes. In this same manner the proper shipments would be determined for succeeding months.

In this analysis the use of general demand functions results in merely formal conclusions which give little information; while the use of a straight line demand curve, which is a first approximation to the demand for many commodities, gives results that permit interpretation and statistical check. Perhaps it should also be pointed out that this method of analysis may be employed with any demand curve that is subject to statistical determination.

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DEPOPULATION OF LOUISIANA'S SUGAR BOWL

The rehabilitation of the sugar industry is one of the most important problems now confronting the State of Louisiana. But, as is the case with other commercial crops, sugar production is no longer a local concern; it is part of a larger national program for agriculture. Few people are familiar with the problems of sugar cane. The serious social consequences brought about by the recent crisis in the sugar cane industry are not widely known nor their significance realized. A thorough appraisal of the social and economic effects of the distress in the sugar cane industry should preface any intelligent program of control or readjustment.

About 1910 a number of serious diseases attacked the canes. Mosaic disease is cited frequently, but there were other complicating factors. This disease made such great inroads into the crops of sugar cane during the World War period that Louisiana's sugar industry was threatened with extinction. In Louisiana the amount of cane¹ used for sugar decreased from 5,887,000 short tons in 1911 to 864,000 in 1926.² The acreage devoted to sugar cane decreased from 310,000 to 129,000.

The one bright spot in the dark picture was the untiring efforts of planters and sugar cane specialists to save the sugar industry. New varieties of cane were developed which were more resistant to disease. Insects which preyed upon the sugar cane borer were discovered, propagated, and disseminated. By 1930 the struggle was

¹ Yearbook of Agriculture 1932 and 1935.

² In terms of refined sugar, the decrease was from 329,879 short tons in 1911 to 44,000 in 1926.

pretty well won and the sugar industry began to revive. Acreage rose to 150,000. Production climbed to 2,559, 000 short tons of cane or 171,000 short tons of refined sugar.

It is difficult to grasp the seriousness of the situation, however, without observing the social wreckage which resulted from the depression in the sugar industry. Abandoned plantations; dismantled sugar houses; unoccupied cabins falling apart from lack of care; fertile and well located lands out of cultivation and growing up with weeds, briars, and thickets; decadent towns, villages, and hamlets; business enterprises closed out, bankrupt, or in straitened circumstances; schools and churches struggling to maintain a semblance of their functions—all of these cried out the depressing story of the collapse of the sugar industry. They indicate the social effects of depression much better than statistics of production.

This paper presents data showing some of the changes in population which accompanied the decadence of the sugar industry.³

For purposes of analysis the parishes of the state were divided into three groups: (1) those in which sugar cane was the primary crop grown in 1910; (2) those growing cane for refining purposes in 1910, but in which this crop was of secondary importance; and (3) the parishes in which this crop was not grown for the purpose of sugar manufacture. The parishes which were devoting in 1910 twenty per cent or more of their cultivated land to sugar cane are classed in the primary sugar area.⁴ These parishes may be taken as representative of the sugar area. Another group of parishes, eleven in number, grew cane for refinery purposes, but devoted less than twenty per cent of their cultivated area to this crop.⁵ The area embraced within these parishes is designated the secondary sugar area. The remaining 40 parishes grew no cane for refining purposes and are called the non-cane parishes.

Table 1 shows the pronounced losses which have occurred in the

³ During the last few years two studies made at the Louisiana Agricultural Experiment station furnish results of significance in showing the social effects of the decline of the sugar industry. One of these studies dealt with the population of the state, the other with farm trade centers in Louisiana. T. Lynn Smith, "Farm Trade Centers in Louisiana, 1901 to 1931," Louisiana Bulletin 234 (1933), and "The Growth of Population in Louisiana, 1890 to 1930," Louisiana Bull. 264 (1935).

⁴ There are twelve of them: Assumption, Iberia, Iberville, Lafourche, Plaquemines, St. Bernard, St. Charles, St. James, St. John the Baptist, St. Mary, Terrebonne, and West Baton Rouge.

⁵ Ascension, Avoyelles, East Baton Rouge, Lafayette, Jefferson, Pointe Coupee, Rapides, St. Landry, St. Martin, Vermilion, and West Feliciana.

TABLE 1. CHANGES IN TOTAL POPULATIONS OF LOUISIANA PARISHES, 1910 TO 1930

	Population				Population		
	1910	1930	Percentage increase		1910	1930	Percentage increase
<i>Primary Cane Area</i>				<i>Partially Cane (Cont'd)</i>			
Assumption	24,128	15,990	-33.7	Pointe Coupee	25,289	21,007	-16.9
Iberia	31,262	28,192	-9.8	Rapides	44,545	65,455	46.9
Iberville	30,954	24,638	-20.4	St. Landry	46,655	60,074	28.8
Lafourche	33,111	32,419	-2.1	St. Martin	23,070	21,767	-5.6
Plaquemines	12,524	9,608	-23.3	Vermilion	23,390	33,684	27.6
St. Bernard	5,277	6,512	23.4	West Feliciana	13,449	10,924	-18.8
St. Charles	11,207	12,111	8.1	Total for the 11 parishes	318,947	413,342	29.6
St. James	23,009	15,338	-33.3	<i>Non-Cane</i>			
St. John	14,338	14,078	-1.8	Acadia	31,847	39,326	23.5
St. Mary	39,368	29,397	-25.3	Allen	12,424	15,261	22.8
Terrebonne	28,320	29,816	5.3	Beauregard	14,303	14,569	1.9
West Baton Rouge	12,636	9,716	-23.1	Bienville	21,776	23,789	9.2
Total for the 12 parishes	266,134	227,815	-14.4	Bossier	21,738	28,388	30.6
<i>Partially Cane</i>				Caddo	58,200	124,670	114.2
Ascension	23,887	18,438	-22.8	Calcasieu	22,956	41,963	82.8
Avoyelles	34,102	34,926	2.4	Caldwell	8,593	10,430	21.4
East Baton Rouge	34,580	68,208	97.2	Cameron	4,288	6,054	41.2
Jefferson	18,247	40,032	119.4	Catahoula	10,415	12,451	19.5
Lafayette	28,733	38,827	35.1	Claiborne	25,050	32,285	28.9

TABLE 1. CHANGES IN TOTAL POPULATIONS OF LOUISIANA PARISHES, 1910 TO 1930 (Continued)

	Population				Population		
	1910	1930	Percentage increase		1910	1930	Percentage increase
<i>Non-Cane (Continued)</i>							
Concordia	14,278	12,778	- 10.5	<i>Non-Cane (Continued)</i>	25,830	54,337	110.4
DeSoto	27,689	31,016	12.0	Ouachita	11,402	16,078	41.0
East Carroll	11,637	15,815	35.9	Red River	15,769	26,374	67.3
East Feliciana	20,055	17,449	- 13.0	Richland			
				Sabine	19,874	24,110	21.3
Evangeline	20,006	25,483	27.4	St. Helena	9,172	8,492	- 7.4
Franklin	11,989	30,530	154.7	St. Tammany	18,917	20,929	10.6
Grant	15,958	15,709	- 1.6	Tangipahoa	29,160	46,227	58.5
Jackson	13,818	13,808	- 0.1	Tensas	17,060	15,096	- 11.5
Jefferson Davis	13,084	19,765	51.1	Union	20,451	20,731	1.4
LaSalle	9,402	11,668	24.1	Vernon	17,384	20,047	15.3
Lincoln	18,485	22,822	23.5	Washington	18,886	29,904	58.3
Livingston	10,627	18,206	71.3	Webster	19,186	29,458	53.5
Madison	10,676	14,829	38.9	West Carroll	6,249	13,895	122.4
Morehouse	18,786	23,689	26.1	Winn	18,357	14,766	- 19.6
Natchitoches	36,455	38,477	5.5				
Orleans	239,075	458,762	35.3	Total for the 41 parishes	1,071,307	1,460,436	36.3

population of the sugar-growing section, losses which were taking place at the same time that the other areas and the state as a whole were rapidly gaining in the number of inhabitants. The twelve cane parishes taken as a unit lost one-sixth of their population between 1910 and 1930. While three of the twelve cane parishes gained inhabitants during the twenty-year period, a word of explanation is necessary. One of these parishes, St. Bernard, is adjacent to the City of New Orleans and has been rapidly developing into a suburban area. A second, St. Charles, is also very near New Orleans and has been greatly influenced by urban developments. Much of this parish has been given over to truck farming; it has become also the seat of extensive oil refining operations. And the third parish which increased in population (Terrebonne), registered a gain of only five per cent, but it also experienced the development of extensive oil fields and an important trucking area. Obviously the gains in these three parishes only make the losses in the other nine appear the more striking. Among the parishes not developing other enterprises to replace sugar, six lost over twenty per cent of their population. The decrease was most pronounced in Assumption, a strictly rural parish which forms the very heart of the "Sugar bowl" and the parish which devoted the highest percentage (51.4) of its cultivated acreage to sugar cane in 1910. The effects of the almost complete failure of the sugar industry can be best seen in this parish and St. James which lost 33.7 and 33.3 per cent, respectively, of their inhabitants. From the demographic point of view there is some evidence that the recent depression was even more demoralizing to the sugar area than the Civil War.

Table 2 shows the relative changes in the white and Negro populations. The decline in population has been limited to Negroes. The white population of the sugar area (aided by a 76 per cent increase in the oil refining parish of St. Charles and 54 per cent increase in the suburban parish of St. Bernard) gained 1.8 per cent between 1910 and 1930, while the Negro population dropped 32 per cent. Only four of the twelve parishes contained fewer white people in 1930 than in 1910, while all twelve parishes contained fewer Negroes in 1930 than in 1910. While the economic loss which came to the owners of the lands and mills is usually stressed, in terms of depopulation, these data leave little room for doubt that the effects of the decline of Louisiana's sugar industry fell first and most heavily upon the Negroes of the area.

TABLE 2. CHANGES IN THE POPULATIONS OF THE SUGAR PARISHES, 1910 TO 1930, BY RACE

Parish	White			Negro		
	1910	1930	Percentage gain or loss	1910	1930	Percentage gain or loss
Total	135,742	138,180	1.8	130,170	88,260	-32.2
Assumption	14,021	9,671	-31.0	10,105	6,319	-37.5
Iberia	16,784	17,439	3.9	14,474	10,733	-25.8
Iberville	11,806	11,900	.8	19,145	12,549	-34.5
Lafourche	25,136	27,087	7.8	7,973	5,313	-33.4
Plaquemines	5,677	5,049	-11.1	6,847	4,530	-33.8
St. Bernard	3,343	5,152	54.1	1,933	1,337	-30.8
St. Charles	4,487	7,902	76.1	6,720	4,199	-37.5
St. James	9,844	7,742	-21.4	13,164	7,550	-42.6
St. John	6,208	7,131	14.9	8,126	6,947	-14.5
St. Mary	18,043	15,035	-16.7	21,266	14,302	-32.7
Terrebonne	16,981	20,491	20.7	11,194	8,349	-25.4
West Baton Rouge	3,412	3,581	5.0	9,223	6,132	-33.5

For one acquainted with the agriculture of Southern Louisiana, the explanation for these changes is not difficult to find. In the first place, it must be kept in mind that the bulk of the idle or abandoned lands in the sugar area are in the large plantations. To give specific data, a recent inventory⁶ of unused cultivatable lands in 13 "Sugar bowl" parishes showed 139,000 acres in holdings above 1,000 acres in size, or 42 per cent of all lands in large plantations. In sharp contrast to this is the fact that holdings of less than 100 acres embraced only 24,000 acres of idle land. This is but 18 per cent of the land in these smaller holdings, thus indicating the close relationship between large holdings and idle lands.

Moreover, it is on the large plantations that the Negro labor is utilized in the production of sugar cane. This large plantation with its Negro labor, extensive holdings, elaborate equipment and fixtures has been the conspicuous unit in the area and is the one described by most persons who have written of southern Louisiana. But with all this, it has been only one of the major systems of agricultural organization in the area. In sharp contrast is the small family-sized farm on which cane is grown by white farm operators. These small farmers have not depended on Negro labor, but have

⁶ R. J. Saville and A. L. Dugas, "Some Characteristics of Cultivatable Land in the Sugar Cane Area of Louisiana," Louisiana Bull. 280, 1936, p. 13.

done most of their work themselves or with the assistance of unpaid family labor. Numbers and not size have made this small-farming unit of fundamental importance. It is the concentration of Negroes on the plantations which makes it readily comprehensible why they left the sugar area in such great numbers. When the situation, resulting from the cane disease, became acute, in many cases the large commercial plantation, with its large overhead, its unwieldiness and sole dependence upon sale of a single crop, and frequently with an absentee owner, was unable to make adjustments. On the other hand the small, family-sized farm, with its greater diversification of crops, its subsistence nature, greater flexibility, and its adaptable size, was adjusted much better to the new circumstances. The Negro laborers left the plantation when their jobs were gone, while the white owners of small farms, remained, attempting to make the difficult downward adjustment.

The white population of the rural areas has almost held its own, while the white population of the urban centers has been increasing. On the other hand, Negroes have become fewer in both rural and urban areas and in about the same proportions. The depressed agriculture of the sugar-cane area has continued to employ the efforts of about the same number of white people, and the towns and small cities in the area have absorbed part of their natural increase. But with Negroes the case has been very different. When the plantation reverted to idleness and grew up to weeds, colored laborers on cane plantations were left without employment, and many of them were forced to move. No refuge for the colored laborer could be found in the neighboring towns.⁷ The net result was that both urban and rural Negroes were forced to leave the cane area. The extent of their removal marks the extent of depopulation in this region. But it is important to note that these changes furnish also a basis for the expectation that the Negro laborers will form the bulk of the thousands of people who will be re-employed with the revival of the sugar industry. This will almost certainly be the case if the plantation is retained as the unit of agricultural organization.

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⁷ In fact some studies indicate that the Negro residents of urban centers were being supplanted in their regular jobs during this period. See T. J. Woofter, Jr., *Economic Status of the Negro* (Chapel Hill, 1930), Mimeographed Edition, pp. 34-40.

FARM LAND APPRAISAL IN ITALY¹

The first book on land appraisal in Italy, "Treatise on Appraisal of Realty for the Instruction and Use of Appraisers,"² was written by C. Trinci in the Eighteenth Century. From that time on Italian literature on land appraisal has been plentiful. The subject has been discussed by a large number of authors who were not always in agreement among themselves. A complete bibliography of appraisal works by Italian authors is included in a book "Lessons in Appraisal" by Ernesto Marenghi published in 1925.³

Even the earliest Italian authors dealt with problems confronting us today. Differences of opinion on such questions as the use of typical or normal farms as a basis for valuation, capitalization method of appraisal, and purpose of valuation, to mention a few, were discussed in the middle of the Eighteenth Century. Gizzi⁴ mentions the normal method of farming in his work "The Instructed Surveyor"⁵ published in 1758. This author says, "... to find the just value of a tract of land it is necessary to know its return, and this must be considered as being secure and stable. One must not confuse the ordinary normal return with extraordinary or accidental return." He also warns against allowing management by the operator to creep into value; because, as he continues, "... otherwise each time the owner would change the price would change."

On the subject of capitalization, Italian literature furnishes numerous references. According to Arrigo Serpieri, many of the attacks of Aereboe in Germany against the capitalization method of appraisal arose because the German authors had not confronted, much less solved, the question of valuation based on normal return. Aereboe is considered as an authority in land appraisal by appraisal workers in Italy as well as in his native country. Many of the Italian authors are members of the same school of thought. The

¹ Prepared under supervision of Dr. Charles L. Stewart, Chief in Land Economics, Department of Agricultural Economics, College of Agriculture, University of Illinois, in connection with translations from selected Italian authorities on valuation of farm real estate.

² Trinci, C., *Trattato delle stime dei beni stabili per istruzione ed uso degli stimatori*; Firenze 1750.

³ Marenghi, Ernesto; "Lezioni di Estimo," Milano, 1925. Appendix No. 2. There are a total of approximately 700 different treatises included in this bibliography.

⁴ Serpieri, Arrigo, *Il metodo di stima dei beni fondiari*, found in "Annali del R. Ist. Superiore Forestale Nazionale," Firenze, Vol. II, 1916-17, pp. 9-10.

⁵ Gizzi, F. Mario, *L'Agrimensore Istruito*. The third edition published in Ferrara, 1767, is mentioned in Marenghi's bibliography.

man who occupied the highest position in this regard in Italy was the late Ernesto Marenghi.

In Italy, just as in this country, separate schools of thought have existed on the method of appraisal to use. Some have complete faith in the capitalization method, while others think the sale price approach (synthetic or direct method) or some variant, of which the Italians have several, is the correct method. All these methods have been discussed and argued at great length.

A criticism of those authors who are trying to construct a science of appraisal is furnished by Guiseppe Medici in his recent volume, "Introduction to Agricultural Appraisal." He says,⁶ "For the simple reason that there do not exist 'facts' of appraisal, it is evident that there cannot exist a science of appraisal. A science cannot be constructed on illusions and cannot take shape merely because of the fact that certain students have perfected exercises of logic, using appraisal as an object of their own brilliant reasoning."

Another view on the nature of appraising is given by Marenghi as follows: "Appraisal has as its fundamental object of study the processes of valuation of economic goods, for which the market does not offer a price under an explicit form."⁷ He continues that, while it is possible to ascertain the prices of grain, livestock products, etc., through observation of market quotations at any particular time or place, it is not possible to observe the prices of particular or individual farms or parcels of real estate. Moreover, he states that appraisal is the formation of a series of methods and steps for the establishment of the money equivalent of those economic goods not having a specific market, but which because of their peculiar individual characteristics, require the knowledge and opinion of persons who live daily in this realm of activity, and therefore, may be considered as experts in their field, even if empiric.

According to Medici,⁸ "the fundamental character of appraisal consists in teaching how to express opinions concerning the sum of money which can be attributed, in view of a specific aim, to whatever economic good is the object of appraisal."

And finally, Serpieri⁹ says that since man has a thousand ties to land, the appraisal of landed goods has resulted in one of the most

⁶ Medici, Guiseppe, *Introduzione all'estimo agrario*, Rome, 1934, p. 6.

⁷ Marenghi, former citation.

⁸ Page 4, former citation.

⁹ Serpieri, former citation, p. 17.

difficult fields of endeavor. In few other cases he points out does economic man differ more from real man than in his reaction toward the valuation and purchase of land. In Italy with its great density of population and predominance of small farms it is almost generally conceded that land should be treated as an instrument of labor rather than as a form of investment or as a simple productive good. Farmers who desire to purchase a small farm do so because it provides them an opportunity to earn a daily wage.

In regard to this concept Marengi makes the following remarks (in discussing the use of the capitalization of returns method of appraisal),¹⁰ "... the net return is determinable only for land having, for lack of a better expression, a capitalistic function. And only in the following cases, therefore, has analytical appraisal (capitalization method) a right of existence: farms that are rented, farms operated in special systems of partnership, or large farms operated with hired help."

In one of the recent Italian appraisal works the following observations are made by the authors:¹¹

"Medici affirms that the postulates of analytical appraisal (capitalization method) cannot be expressions of financial arithmetic but coincide with the fundamental theories of static economics. . . . 'the vital and imperishable part of analytical appraisal consists, therefore, in the systematic research which it requires. Its weakness lies in the presumption of desiring to arrive at land values by strictly applying the norms of static economics'."

All Italian appraisal authorities are in accord in classifying all methods of appraisal into two groups, synthetic and analytic.¹² It is said to be analytic when appraisals are made by means of the analysis of returns, synthetic when accomplished by any other means.

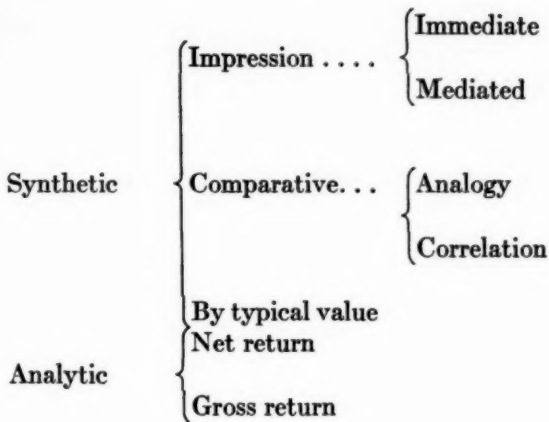
Marengi has divided these two appraisal classifications as shown on page 513.

According to Marengi appraisal by impression is immediate. "If he who makes the appraisal judges only according to his own sight and opinion." It is mediated if the appraisal judgment is based on the estimations and opinions of other persons, these

¹⁰ Marengi, former citation, pp. 68-69.

¹¹ Vigiani, D.—Scrivere, G., *Trattato di Estimo Rurale* (Treatise on Rural Appraisal), Milano, Genoa-Roma-Napoli, 1937-XV, footnote, p. 39.

¹² Antonelli, Guiseppe, *Estimo, rurale, civile e cadastale* (Rural, Civil and Cadastral Appraisal), Acquila, 1929, p. 98. Firenze, 1934, p. 98.



opinions being evaluated and elaborated in a suitable manner. In the opinion of the author this latter method, if well applied, may render valuable service in practice, especially if competent people are contacted in the proper manner.

Comparative appraisal by analogy is accomplished by making particular comparisons. This may assume two separate forms, the one simple, the other complex. In the former case the farm in question is compared with a single farm; in the latter case, to a certain number of homogeneous farms. The quantitative elements which serve as a basis for this kind of appraisal, as a rule are: (1) the cash rent (2) the cadastral return, or (3) the amount of taxes.

Complex comparative appraisal is performed in the same manner as the simple comparative, except that the average market value of a certain number of homogeneous farms is used in the equation as the element of comparison.

Whenever possible, Marengi advises the use of cash rent as the comparative element because of the known inconsistencies attached to taxes. Furthermore, in order that valuation according to the above method may furnish satisfactory and justifiable results, it is necessary that: the farms be homogeneous, the known prices be normal and that the quantitative element that serves as a basis of the appraisal in both cases, have the same relationship to the corresponding capital value.

In the correlation method of appraisal certain correlation coefficients have been ascertained. These coefficients are used in obtaining the value sought.

Thus in some parts of Tuscany according to Marengi,¹³ chestnut groves are valued by multiplying the average annual production (of fruit) by a given coefficient. Each bag of chestnut flour (about 73 liters) corresponds to a land capital value of 350-400 liras. He states that this method gives results of broad approximation only; however, it may be useful for the purposes of farm accounting where the necessary adjustments can be made.

*Synthetic appraisal by typical values*¹⁴ finds extended application in the valuation of (1) small properties which represent more than one form of capital investment, or properties which may be treated as instruments of labor; (2) isolated parcels of land that can be assigned to a particular and clearly defined land use. This method requires the division of the area into homogeneous parcels.

The determination of the unit prices may be computed on the basis of the average value-ratio that is presumed to exist between the values of the various land-use classifications, after having made suitable deductions for farm buildings. In addition Marengi says that the better sources of unit prices are furnished by practical men operating in the field of agriculture, such as appraisers, notaries, farm experts and farmers.

Italian authors have divided analytical appraisal (capitalization method) into several distinct divisions. One is used in finding the probable market price, the others in finding a value for taxation, hereditary division, appraisal of damages, security value and for other purposes.

These distinctions require a decision as to which of several types of farm returns should be capitalized. It is clear that if money is invested in a farm by an owner who intends to operate the farm himself, or who intends to rent it, then the return to be capitalized must include not only the normal net return but also the so-called direct return (conveniences) offered by the farm, because of the value that is implicitly applied to these conveniences by the purchaser (and if rented, by the tenant). In regions where cash renting is predominant it is considered advisable to use the normal net cash rent as the return to be capitalized, otherwise the ordinary analysis of receipts and expenses may be used.

¹³ For an interesting discussion on this method of appraisal, see Marengi, former citation, pp. 41-42.

¹⁴ Marengi, former citation, pp. 44-45.

According to Serpieri^{14a} it is easy to justify the application of the analytical method in the appraisal of land, when its purpose is other than the ascertainment of the market price. In discussing the advisability of investing savings in land purely as a financial proposition, he maintains that it is useless to object that the price resulting from capitalizing the normal average return is not enough to acquire the land, because this is exactly what was asked of the appraiser. The appraiser is making it possible for his client to arrive at a conclusion, that such an investment is or is not advisable.

Serpieri says, "The determination of the security value of farms constituting mortgage guarantees, appraisal by capitalization of returns, with a rate deduced from secure investments, may be more prudent. Clerici maintains that this appraisal, in comparison to that based on the current market prices, offers greater security to the borrower of satisfactorily placing him in a position, and enabling him for the duration of the mortgage, to make his interest payments on time, accumulate machinery, pay for insurance and also allow for amortization. And it *may* also throw better light on the endurance of this value, during the extent of the mortgage, independently of the oscillations of the current price."

In adopting the analytical method of appraisal as an instrument in ascertaining the market price, it is necessary to select an appropriate rate of capitalization. It is at this point, as Italian appraisal writers have emphasized, that we encounter the gravest difficulties of this method. Not only must a rate be chosen but it is assumed that this rate is to remain the same for the future. Followers of this method must also choose a capitalization rate which encounters the well known difficulty of the great difference in valuation caused by a slight increase or decrease in the rate.

Another difficulty is encountered when an attempt is made to allow for the conveniences furnished by a particular farm. An arbitrary figure can be assumed, which in the mind of many authors, is then either scaled up or down to coincide with a value that either consciously or otherwise had been pre-established.

In discussing the selection of a rate of capitalization, Serpieri maintains that in preference to adopting the known rate of other investments that are in competition and analogous to the investment of savings in land, we ought to consider the *de facto* or actual return of investments in the acquisition of land, a method called

^{14a} Serpieri, (former citation p. 15).

"direct research for rate of capitalization," by Serpieri.¹⁵ Knowing that the rate changes in accordance with the net return and with the difference in the kind and amount of conveniences offered by the farm, Serpieri suggests that just as farms are divided into classes pertaining to risk, they may be divided into classes on the basis of conveniences.

"Therefore," he continues, "in desiring to investigate the variations of the rates with the various entities of *direct services*, it would not be enough to distinguish, as we did for risk, the various classes of conveniences. It would be necessary to go beyond this and set up a classification of farms of known prices, in groups, such that in each group there would be farms having approximately the same total net return (not per hectare). After that, for each of these groups, it would be possible to proceed to the further division of classes of conveniences, and to the determination of the corresponding rate."

It is clear that the procedure is complicated and requires the knowledge of a great number of relative facts, such as prices of farms, size of farm, type of roads, and distance from markets. However, if the *de facto* rate of land investments is to be ascertained it is impossible to proceed otherwise.

Concerning the valuation of land using as a basis its gross return, investigations carried on by some Italian authors have shown that there exists a strict relationship between the value of a farm and its respective gross return. Ernst Laur of Switzerland maintains that for each characteristic type of farm there exists a relationship (K) between the value (V) and the gross return (R). From this we can see that $V = KR$. The difficult part of this method is the determination of K . This value varies because of many factors such as size of farm, type of farming and kind of crops. This method would require a great deal of statistical information concerning farms in fairly well defined zones. The specific claim made for this appraisal method, briefly stated, consists in eliminating the determination of the net return, which as was mentioned earlier, may be entirely lacking. Under these particular circumstances, small farms that are considered as instruments of labor may be more appropriately appraised.

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¹⁵ For an interesting discussion of this question see, Art. 20, p. 19, in Serpieri's work (former citation).

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BOOK REVIEWS

Agrarkrisen und Stockungsspannen. Zur Frage der langen "Welle" in der wirtschaftlichen Entwicklung, by Dr. Siegfried von Ciriacy-Wantrup. Berlin: Verlagsbuchhandlung Paul Parey. 1936. 445 pp. Rm. 23.

In the growing literature on agricultural depressions the monograph of Dr. von Ciriacy deserves an outstanding place, for its broad historical foundation and perspective, for its serious attempt to build up the analysis on a theoretical basis, for the unusually broad range of general problems touched upon, and for the philosophical interpretation of economic history behind the whole reasoning. Considering the agricultural crisis—in spite of the etymological root of the word, but in accordance with usage in German literature—as a protracted depression, Dr. v. Ciriacy interprets it as a phenomenon accompanying the unsteadiness of industrial development. The agricultural crisis is, in his opinion, due to a decline in demand during periods of retardation in the growth of basic industries. He denies most emphatically that a change in supply conditions can lead to an agricultural depression, that an increasing productivity of farming may run ahead of the growth of population and its current demand, thus creating a surplus. The decisive forces regulating the relation between supply and demand in agriculture, particularly in so far as grain production is concerned, lie, according to the author, on the demand side. Since he correctly interprets the agricultural depression as a long run phenomenon, covering a period of many business cycles, he certainly does not have in mind the changes in demand during the course of a business cycle. On the contrary, the main idea, around which the whole book is built, is the change in the income available for the purchase of agricultural products during a period of retardation in the growth of industry. The agricultural depressions since the beginning of the 19th century—the first after the Napoleonic Wars, the second in the last quarter of the 19th century and the third after the World War—fall, as the author assumes, in the long period of industrial stagnation. In all these periods the income of the masses greatly declined, and this led to a depression in agriculture. He does not deny fluctuations in acreage and yield also in these periods, but in his opinion there was no increase of supply sufficient to explain a price collapse. The reviewer agrees with the

author that a change in technique, however great it might be, does not mean per se that a destructive influence on prices must result. Technical improvements mean only lowering of costs. Unless this leads to an expansion of production technical progress cannot be regarded as responsible for the depression. But was this not the case after the War? In the opinion of the author, however, the expansion of wheat production in the western area of the United States, in Australia and Argentina after the World War had only added to the pressure on prices caused by the recovery of European wheat production. It might be difficult to bring a satisfactory proof that in the agricultural depression after the Napoleonic Wars and in the last quarter of the 19th century the change in productivity of grain farming was the predominant factor in creating long period maladjustments. But the author makes it too easy for himself in denying the role of technical progress in the recent agricultural depression. He obviously underestimates the expansion of wheat production after the War. The world wheat production (excluding Russia and China) increased between 1916-20 and 1928-32 by more than 30 per cent. This expansion is quite sufficient to play the important part in determining the agricultural depression attributed to it by Dr. Timoschenko, Sering and other investigators. In spite of the rather clear indication for the post war period, the author makes the futile attempt to show that also in this period a decline of consumers' income as the result of a retardation in the industrial development is responsible for the agricultural depression. Particularly disastrous for agriculture is, according to the author, the—assumed—fact of great flexibility of agricultural prices and rigid prices for industrial products and labor. To make such a statement with regard to earlier periods means simply to generalize some recent experiences in Europe where for industrial products and labor more or less monopolistic conditions prevail.

Dr. v. Ciriacy interprets long run fluctuations in industry quite differently from most investigators. The difference has far reaching consequences. He considers wars and armaments as factors decisively affecting the extent of savings and investments which in turn determine long waves. Fluctuations in gold supply, which many authors consider as determining the long waves, are—according to him—partly the direct effect of wars, partly the effect of prices substantially determined by wars. Technological progress

may—in his opinion—play an important role in creating short cycles, but in the determination of long waves it plays a subordinate part as compared with wars.

Whether wars show a periodicity, as the author believes, and whether it is admissible to compare the effect of the Napoleonic Wars with those in the last third of the 19th century, is beyond our competence to judge. It seems to the reviewer, however, that the author should have examined more critically whether long waves exist at all, in so far as total production is concerned, before trying to determine what the influence of wars on long waves might be. It is much too early to take the existence of long waves for granted, ignoring serious arguments against this, as, for example, those of Arthur F. Burns. The industrial development may go on in some periods at a decreased rate, but does this necessarily mean that in those periods the total nominal income declined absolutely? Such a decline is to be expected only during the depression phase of a short cycle. It would therefore be necessary to show the interrelation between short term cycles and long run fluctuations in order to determine the influence of the purchasing power available for agricultural products. The problem is far more complex than the author assumes. If demand plays the predominant role he attributes to it, he should have centered his analysis on short cycles because only these periods reveal during the depression a decline in income. But, of course, he could not do so, without undermining the strength of his whole reasoning.

The claim of the author to present a general theory of agricultural depressions can hardly be fulfilled. Representing a partial disturbance, it is questionable whether agricultural depressions can be explained on the same logical basis as short run business cycles with their more or less periodical character. Since the beginning of the 19th century we have observed only three major agricultural depressions. For this reason alone we should be very careful when generalizing. From a theoretical point of view we can only determine under which conditions an agricultural depression may occur. Contrary to the author's opinion the reviewer believes that among these the conditions of supply must be considered essential. But agricultural depressions are very complex phenomena which cannot be described adequately as the effect of a single factor without taking into account contributory circumstances. The demand situation is undoubtedly one of them. Thus by its very nature the

explanation of an agricultural depression becomes pluralistic. The fundamental difference between various approaches in explaining agricultural depressions lies in the emphasis upon different conditions and their interrelations. Dr. v. Ciriacy achieved his monistic explanation by underestimating essential conditions. His monograph, nevertheless, is a remarkable piece of work. It is full of historical and statistical information and challenging ideas which are certain to stimulate further investigation.

EUGEN ALTSCHUL

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World Prices and the Building Industry, by George F. Warren and Frank A. Pearson. New York: John Wiley & Sons, Inc. 1937. Pp. 240. \$3.50.

In this volume Professors Warren and Pearson restate some of the principles already made familiar in their previous studies, *Prices* (1932) and *Gold and Prices* (1935). New index numbers have been compiled by the authors to measure the average change in the prices of forty identical basic commodities in a number of countries beginning 1910. From the index numbers relating to seven of these countries a weighted "world" index in terms of gold is developed. Part of the discussion relates to this so-called world index and part to the price movements both in gold and in currency since about 1910 in various individual countries as well as for various groups of commodities.

In Part II of the book the writers turn to an entirely different aspect of economic change and present an interesting and useful collection of charts, with brief comment, relating to the major changes and cyclical movements in construction, mainly in the United States, but also including some foreign experience. The relations of the building cycle to other types of long-term changes, such as are found, for example, in the livestock industry or in the expansion and contraction of bank credit, are briefly discussed, with emphasis on the conclusion that the familiar "business cycle" is really a weighted combination of fairly definite individual movements, which have dissimilar periodicity and which develop their own momentum.

In the final chapter the conclusion is developed that if the rising phase of the composite business or production cycle happens to coincide with a rise of commodity prices, the general upswing in

business will tend to be exaggerated, while in the converse case the down-swing will tend to be long and severe, as in the period after 1929.

Returning to the writers' results on index numbers of prices, it appears that an identical list of raw materials was used for each of the countries for which indexes were computed. In this list roughly two-thirds of the final weighting consists of products of agriculture and the balance consists mainly of minerals. Questions might be raised as to the reasonableness of this weighting, as well as the desirability of applying an identical list of commodities to various countries, some of which are predominantly industrial while others are extractive or agricultural. The final results, however, do not differ markedly from existing index numbers of basic materials, bearing in mind that it may not be strictly accurate to regard these index numbers as uniformly applicable to all countries or capable of being considered a true picture of "world" raw material prices.

Considerable attention is devoted to the relation in each country of prices in terms of currency to prices in terms of gold. Warren and Pearson insist that the breakdown of both gold and currency prices after 1929 occurred because of a rise in the "demand" for gold; and that when this demand was modified in any country by departure from gold or a rise in the price of gold, the raw materials index in currency invariably rose. Little attention is paid to the possibility that physical supplies of raw materials accumulated as the depression developed and the flow of trade was hampered by many special obstacles, some of them political. Conversely, when prices rose after 1932, it is not improbable that one important factor in most countries was the fear of inflation policies and the renewed absorption of goods through forward buying, coupled with powerful international efforts to reduce production and stocks. Warren and Pearson at no point attempt to show just what is meant by the varying "demand for gold" or in what way this concept is related to an interpretation of price movements in terms of the varying quantity of currency media. To regard the demand for gold as being itself a function of credit expansion and contraction appears highly metaphysical and not likely to afford a useful tool for thought. Too much of the reasoning in this work suggests the attempt to analyze causation in terms of a preconceived practical remedy: a change in the convertibility or price of gold can affect prices of raw materials, hence all such changes must be

analyzed in terms of gold. One particularly unsatisfactory feature of the reasoning is the tendency to confuse the purchasing power of gold over commodities, as measured by the raw materials price index, and the demand for gold as money. There seems also to be an actual misinterpretation of facts, in referring, for example, to Great Britain's "raising" her price of gold when, as a matter of fact, all that was done was to abandon the fixed gold standard, permitting gold to sell at the market valuation. It is this propensity of the writers to insist that all of the recent changes in policy with reference to gold are deliberate and designed to raise basic prices that occasions the greatest doubts in the mind of the reviewer as to the scientific value of the analysis. It seems reasonably certain that an analysis involving so metaphysical and inadequate a study of causation may be highly dangerous when it becomes a basis for practical policy. Indeed the confident forecast which was made by the authors at the conclusion of their discussion and resting upon their general reasoning has already been emphatically refuted by the facts.

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The Economics of Cooperative Marketing, by Henry H. Bakken and Marvin A. Schaars. New York: McGraw-Hill Book Co., Inc. 1937. Pp. viii, 583. \$4.00.

Teachers of cooperative marketing have long been in need of a good textbook and have been awaiting the opportunity to examine this, the latest of attempts to satisfy the need.

"The purpose of this book is to present a comprehensive statement of the basic philosophy, the decisive principles, and the practical methodology of cooperation. It is designed primarily as a college text, not for the sole purpose of arousing intellectual curiosity, but as a valuable source of information for those who may teach this subject or come in contact with the broad realities of the movement through actual participation as members, directors, and employees" (p. v).

The subject is treated under five main subheads: Part I deals with the evolution of cooperative buying and selling. It gives the setting of cooperation in economic society, traces the development in early history and in the United States as well as abroad. Part II deals with the economic philosophy of cooperative marketing in

the United States under such headings as: basic economic concepts of the cooperative movement, principles of cooperative sales and purchasing associations, formation of cooperatives, types of cooperatives and membership relations. Part III considers legal aspects. Part IV takes up such functional aspects as management, financing, pooling, sales policies, and control of production and distribution. Part V discusses cooperation in perspective, particularly with reference to limitations and possibilities and the future of cooperation.

One of the intriguing topics covered is that in the two chapters on "principles." These "principles" are for the most part merely stated as section headings, each followed by a page or two of discussion. The concept "principle" is explained as follows:

"The principles of cooperation are the basic concepts which determine the sphere of collective action. Generalizations as to the elements indispensable to a particular type of enterprise are drawn from a vast field of successful experiences in cooperative effort. Principles are derived from these generalizations by the process of logical reasoning and are verified through tests of broad application."

Then follows a list of nine "principles" for sales organizations, such as "(1) membership selection, (2) functional and commodity specialization, (3) democratic representation," . . . (p. 148).

These two chapters should be of particular interest to advanced students and doubtless to the practical man. Some of the sections are well done, but others leave the reader unsatisfied. A question which arises in the mind of the critical reader but which is not adequately discussed concerns the validity of giving a different set of "principles" for sales organizations and for purchasing organizations. As distinct from the type of "principles" for sales organizations mentioned above, the list of "principles" for purchasing associations is the usual list of "Rochdale principles," e.g., "(1) open membership, (2) democratic control, (3) dividend on purchases," etc. (p. 171).

There seems to be a tendency to shift back and forth between "basic philosophy" and "practical methodology." Thus, after being immersed in "principles" for two chapters (pp. 145-185), one is a bit surprised to come upon what is apparently a set of rules for the formation of cooperative associations (pp. 186-203).

Again, some chapters, after starting with interesting headings,

leave one with the feeling that they have gone somewhat afield for "basic philosophy." This is true, for example, in Chapter II on "The Forerunners of the Cooperative Movement," Chapter V on "Basic Economic Concepts of the Cooperative Movement," and Chapter X on "Membership Relations." Thus, the latter devotes some ten pages to a philosophical discussion of Adolph Wagner's five leading motives for economic action and ends with a discussion of some of the more practical aspects of the problem.

The reviewer has the feeling that the treatment at several such points will not quite satisfy either the man who is looking for "things basic" or the man in search of "the practical."

One of the things that strikes the "teaching" or "researching" reader before he has gone far is the lack of consistently adequate footnotes. Although some chapters are well documented, the reviewer repeatedly noted points at which he would like to know the sources. For the casual reader who accepts as gospel what is "in a book," footnotes are a nuisance. Most readers merely tolerate them, but certain readers need them. They want more detail on the points discussed; they want to be able to verify the facts given; and they want to ascertain whether the author has made the interpretations with which they agree. Such readers will find this book in various parts inadequate, in others, well done.

Although the reviewer found himself noting what struck him as instances of error in fact, inaccurate or awkward statement, or inadequate analysis, the book is, on the whole, well done. It contains a large amount of useful information and worthwhile philosophizing on cooperative marketing. It should find an important place in the textbook field.

H. E. ERDMAN

University of California

Problems in Agricultural Marketing, by Deane W. Malott. New York: McGraw-Hill Book Company, Inc. 1938. Pp. xiii, 410. \$3.00.

This is a "case" book for college students of agricultural marketing. The author, in his preface, says:

"The cases are arranged under section headings roughly conforming to the subject matter of agricultural marketing textbooks. Questions at the end of each case present a possible focus of analysis and discussion looking toward the formulation of sound marketing

principles . . . The suggested readings are . . . intended to furnish additional general background, augmenting the material presented in the specific cases."

A case book of this sort is not like a monograph or research report which proceeds from specific facts and assumptions to definite conclusions, to be appraised by accepted research standards. A case book merely presents problems, not conclusions; it is to be judged by other criteria: (1) Are the cases clearly presented and interesting? (2) Do they raise sharply defined problems? (3) And, most important of all, do they not only "look toward the formulation of sound marketing principles" but present facts and raise questions, the answers to which actually lead the student into that formulation?

With respect to the first two of these criteria, the reviewer feels that the book measures up well. With respect to the third and crucial criterion—the extent to which the cases stimulate the student to discover general principles applicable to other cases—he has one or two reservations. The reason for this is that the book covers territory of which some is familiar ground to an agricultural economist, but some is not. It is a business-school book. The first paragraph of the preface states that the cases deal with "the problems faced by those engaged in the various phases of agricultural marketing . . . typical of those situations which constantly appear for decision in the conduct of the various agricultural industries." That is, the book is based upon the entrepreneurial, business-decision approach.

If the book stayed within the limits thus laid down, the reviewer might feel a little out of his element. But in actuality the book ranges considerably farther than its preface indicates. The field of agricultural marketing can be investigated from several points of view other than the entrepreneurial, and several of these are represented in the book.

We might distinguish these several viewpoints briefly. (1) *The entrepreneurial, business-school point of view.* As the operator of an agricultural marketing business, how can I run it more successfully? In the case of future trading, for example, how can I hedge, or in other situations, speculate, with the greatest profit to my business?

(2) *The point of view of an agricultural industry as a whole.* As a farmer or trader, I might learn (by study from the entrepreneurial

point of view) how to profit from wide swings in agricultural prices; but it might be better for that agricultural industry, although conceivably less profitable for me, if agricultural prices were stabilized. This would require study from the viewpoint of the entire agricultural industry, involving different principles from those required for entrepreneurial study.

(3) *The viewpoint of society as a whole.* Crop production control might be a good thing for agriculture as an industry, but it might lead to exploitation of the consumer, similar in kind although probably less in degree than that to which we have become accustomed by industrial monopolies. Here, again, a whole new set of principles is involved.

The first point of view, the entrepreneurial, is evident in the first group of cases (as would be expected from its title, "Marketing by the Agricultural Producer at County Points") and in some of the other groups, specifically in the questions on pages 116, 126, 130, 138, 168, 175, 181, etc. The second point of view, that of agriculture as an industry, is evident in the middle section of the book, in most of the questions on pages 195, 251, 270, 276, 288, 298, etc. The third point of view, that of society as a whole, is revealed in the last group of cases, which deal with national problems of agricultural policy.

The book would benefit from a specific statement of the different points of view or types of problems included either in the preface or in the body of the text itself. The author has grouped similar problems under appropriate headings as a step in that direction, but an explicit statement accompanied by some discussion would be even better.

How well the cases do "look toward the formulation of sound marketing principles," the reviewer is not fully competent to judge; some of the cases lead to entrepreneurial business-school principles that lie outside of his experience. For example, the cases under the heading "Cooperative Marketing" do not lead to the generally accepted "principles of cooperation" of one man one vote, limited returns to capital, and patronage dividends, that appear important to agricultural economists. Similarly, the principles behind many of the other cases are probably more clear and appear more important to professors of business than to agricultural economists. But some of the cases do lead toward ground that is familiar to us. The first case under the heading "Organization and Operation of the Futures Exchanges" ends with the questions:

"1. Is trading in futures contracts a necessary part of the mechanism of a grain market?

"2. What requirements must a commodity fulfill in order to make it subject to futures contracts?

"3. Is the presence of futures trading likely to affect the prices received for grain by the grain producers?"

If the student is referred by the teacher to the standard references on speculation (some of which are listed later on in the book), to the reports of the Commodity Exchange Administration, and to various articles in the technical economic journals, then answering these questions will give him a grasp of what most agricultural economists would recognize as the general principles of speculative activity.

Similarly, in the last group of cases, entitled "National Problems of Agricultural Policy," the questions at the end are broad and fundamental; e.g., on page 377, "Is Federal control of agriculture based upon payments for crop restriction a sound exercise of the functions of government?"; with reference to the milk industry, on page 391, "Is regulation of the sort contemplated by Federal orders under the AAA likely to succeed?" These questions transcend the borders of "orthodox" business-school inquiry; almost indeed they transcend the borders of the entire field of agricultural marketing; and the reviewer is highly pleased to find them in the book.

The bulk of the book, however, deals with business-school problems outside the range of immediate interest of agricultural economists. And most agricultural economists are so well immersed in those problems in the book that do lie in their field of interest, that they will probably prefer to continue drawing their case material from all about them—from the agricultural press, from this or that student's own experience (as with marketing hogs or storing corn), from their last committee meeting with farmers, marketing agencies, administrative officials, etc., from the congressional report of the most recent AAA Act, and from their own current research. The book will probably be well liked and well used, however, by business-school professors, who do not ordinarily have these close contacts with current agricultural problems. The author has done a good job of writing a case book that meets their needs.

GEOFFREY SHEPHERD

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The Income Structure of the United States, by Maurice Leven. The Brookings Institution, Washington, D. C. 1938. Pp. x, 177. \$1.50.

"The Income Structure of the United States" is an interesting treatise on what determines income and why it is unequally distributed. Dr. Leven very aptly describes the content of the book in his statement that "the purpose of analyzing the determinants of income was to place in proper perspective the dependence of income upon productive activities and to show its relationship to the circumstances and conditions under which different individuals conduct their economic operations."

The book is largely a further explanation of the statistics drawn upon in preparing "America's Capacity to Consume," one of the reports in the study of income and economic progress recently made by The Brookings Institution. Dr. Leven has brought together the various sources of information which bear upon the distribution of income among individuals and given them life by showing the effect of occupation, geographic location, age, sex and color upon the distribution of income among individuals in the United States. Many of the data relate to the year 1929, but in showing the influence of the ebb and flow of business, technological progress, and group action by farmers, labor unions, and others upon the distribution of income, he has incorporated such statistical data on income as have become available between the years 1929 and 1937.

One of the most interesting chapters in the book is the one titled "Secondary Income" which contains a discussion of the factors causing a redistribution of the income derived from productive activities. Gifts, Government relief, services rendered free by Government and non-profit private organizations, investment of savings, and trading in existing wealth, bring about a marked redistribution of income, according to Dr. Leven, with the result that lower income groups have available for consumption a much larger income than was originally received, whereas the higher income groups consume much less than is received.

In connection with the effect of occupation upon the distribution of income, the statistics of payrolls in the railroad, iron and steel, and building industries have been presented in detail.

A chapter is devoted also to the effect of changes in wages and hours worked per week in different industries since 1929, and their

effect upon the distribution of income. It is pointed out that the changes in wages and hours, lower interest rates and dividend payments, and other factors, have reduced the incomes of those who received relatively high incomes in 1929 much more than those who were in the low income groups in that year.

C. M. PURVES

Bureau of Agricultural Economics

Rural Trends in Depression Years, A Survey of Village-centered Agricultural Communities 1930-1936, by Edmund deS. Brunner and Irving Lorge. New York, Columbia University Press, 1937. 387 pp., \$3.25.

As stated by the authors in their introduction, "the report opens with a summary of the basic changes in the adjustments of agriculture from 1930 to 1935 as shown by the census and illustrated in the communities studied." There follows an analysis of changes in population and in communities as such and in the relations of village to country. The discussion then turns to changes in institutions such as those of trade, industry, banking, education, religion, and social life. In connection with education, special attention is given to the rise of adult education during the depression years. Finally, consideration is given to the question of relief, a phenomenon previously almost nonexistent in these communities.

The reader who is not familiar with rural social literature may find "Rural Trends in Depression Years" tedious and not very stimulating. "Village Communities" by deS. Brunner, 1927, and "Rural Social Trends" by the same author and J. H. Kolb, 1933, should be read as a background for the more recent book. These two reports contribute much to the appreciation of the facts that are summarized in "Rural Trends in Depression Years." Since this study of rural trends is largely based upon surveys of villages, it might be more appropriately described as "Social Trends in Villages in Agricultural Areas."

This book presents the results of the third survey of 140 village-centered agricultural communities scattered throughout the major regions or crop areas of practically the entire country. Two previous surveys of these centers have been made under the same director, one immediately following the first post-war depression, 1923-25, and the other at the beginning of the second great post-war depression, 1930-32. The survey reported in this volume was

made in 1936. The report undertakes, among other things, to compare the findings of 1936 with those of the two previous surveys. The statements as to trends are deduced from censuses of agriculture and of population, as well as from the surveys. In addition to statistical data and judgments as to the trends that are indicated by such data, the authors undertake, in the last chapter of the book, to present some ideas as to what ought to be done for the benefit of rural communities.

The general reader and even the student of social problems may find it somewhat difficult to distinguish between real trends and temporary or cyclical tendencies which are likely to be reversed or to disappear in a short time. The three surveys seem to indicate three general social trends:

(1) The number of villages and the village population are increasing.

(2) Rural social organizations are shifting to the village. Neighborhood activities in the open country are declining; the consolidation of rural schools in village centers continues; and small churches are being abandoned or united, in both open country and village, with some of the open-country membership shifting to the village.

(3) Some village services to the farm community, including grocery stores and gas stations, are being maintained and increased, whereas others are shifting to larger population centers.

Some of these tendencies were checked by the depression and others were reinforced by it. The depression caused many people to return to rural communities from large industrial centers. Some of them went back on the farms or to reinhabit open-country dwellings, but many of them also returned to the villages. On the other hand, some open-country people went to the villages for relief or an occasional day's work in lieu of regular employment on farms.

The discussions of relief in rural areas and the increase in small-town merchandising seem to the reviewer the least satisfactory parts of the book. The relief situation in rural villages is, of course, difficult to analyze, and deserves more extended analytical treatment. The authors seem to have missed an important point in attempting to explain the marked increase in grocery stores and gasoline stations occurring in villages during a time of depression. This increase was probably brought about by persons who had lost employment or income. It would seem natural for such persons to

turn to a type of enterprise open to individual initiative and requiring little or no investment.

The findings as to trends in cooperative organizations and attitudes toward social institutions, including government policies, are inconclusive. The statements with reference to attitudes seem to be influenced largely by conditions current when the surveys were made. The underlying and substantial trends in thinking are not revealed.

After recording the results of the survey of 1936, the authors, recognizing the challenge to social scientists to act on their findings, undertake some interpretations of the facts brought out by the three surveys. They wish their observations to be considered as a basis for experimentation and policy making for the improvement of rural communities. In a spirit of meekness, they make some suggestions pointing toward action programs. These suggestions may be briefly summarized as follows:

(1) Although migration movements can not be controlled, they ought to be influenced by education and some restraints.

(2) The government should develop an occupational outlook service.

(3) Adult education should be further developed, particularly with reference to cooperation and social attitudes.

(4) The activities of the Agricultural Extension Service should be extended to the entire rural population, to include villagers with farmers.

(5) The school system generally should be reorganized and supported more largely from state and national funds.

(6) Religious institutions in rural communities should unite to improve their individual and social services.

(7) Although present conditions may make expedient the reduction of agricultural production by control, the real national goal should be the improvement of well-being, rather than the creation of scarcity in order to improve the economic condition of the rural dweller. In short, the authors urge that the goal for agricultural adjustment include social parity as well as, or rather than, economic parity.

Doubtless this book will be found valuable to teachers and students, not only because of the data supplied, but also on account of the suggestions presented in the concluding chapter. As stated by the authors, "this is the first time in rural social research that a nation-wide sample of communities has been thrice visited and studied." It is to be hoped that means will be found for continuing a periodical survey of agriculturally centered villages. The reviewer wishes to suggest that in future surveys more attention be given to people who live between the village and the farm—that is, the

non-farm, open-country resident; and that data should be collected, if possible, as to the distribution of income and of services recognized to mark progress in improving living conditions.

O. C. STINE

Bureau of Agricultural Economics

Rural Life in the Depression, by Dwight Sanderson. New York. Social Science Research Council, 1937. Bulletin 34, pp. 169. \$1.00.

Dr. Sanderson's monograph on *Rural Life in the Depression* is one of thirteen studies "sponsored by the Social Science Research Council to stimulate the study of depression effects on various social institutions." A threefold goal was imposed upon the authors of each of the thirteen studies, in common, although the council allowed "freedom in approach and organization." Translated in terms of Dr. Sanderson's problem, this threefold goal was (1) to examine critically the literature and interpretations of rural life during the depression, (2) to point out the inadequacies of such information, (3) to suggest the research most needed for an understanding of the problem.

The method of study employed by Dr. Sanderson, while not especially unique, is probably as effective as any that might have been employed in this type of study. As he states it, "this report is but a compilation of ideas and data obtained from many persons and sources. To obtain a preliminary orientation, letters were written to about one hundred leaders in rural life throughout the country . . ." The report is divided into ten chapters, eight of which are titled according to topics or problems that were felt to be of especial significance in revealing the effects of the depression on rural life.

Some of the more important topics treated in the monograph are: population composition, changes and migration; readjustment problems of agriculture, including land retirement, resettlement and relief; the social problems of agricultural stratification involved in tenancy, migratory labor and part-time farming; the rural social institutions of family, school and church; and the attitude of farmers toward their vocation as a way of life.

Dr. Sanderson points out the specific problems in need of additional research in connection with each of the topics. Throughout his monograph, however, he emphasizes the general and important

need for continuing research on all problems over a period of years, in order that changing trends may be accurately observed and evaluated. Such research would follow the form of the series of village studies conducted by Brunner and Kolb. A further need, which he notes, is for the more accurate interpretation of the data collected. Data must be interpreted in the proper social *milieu*, and this calls for accurate delimitation of culture areas or sub-regions.

The various studies in standards of living, dependency and security, indicate changing trends in all phases of rural life. One of the most significant of these is an apparently growing dependency of farm folk on the government. A concomitant development is an increased appreciation of the value of collectivism as a means of improving rural conditions. Security has had two opposing developments: the better farmers have grown more attached to their farms, while the poorer class, especially those who have descended the agricultural ladder, have become dissatisfied with agriculture and have tended to swell the ranks of the "radical" minded groups.

In concluding the monograph, Dr. Sanderson observes that he has "found little evidence of any occurrences which will necessarily permanently affect basic rural patterns." The logic of this conclusion is debatable, especially in view of the changing trends that are noted throughout the bulletin. Surely, a declining birth rate, growing dependency *mores*, increasing discontent with farming as a way of life, and collectivism, to mention a few of the more influential factors, must have a decided and permanent effect upon rural culture. Further, Dr. Sanderson mentions a rapid change in ideologies. This change cannot help being directly reflected in the values which motivate the behavior of rural peoples.

Dr. Sanderson has covered his subject with both thoroughness and understanding. His experience as Coordinator of Rural Social Research in the early days of the Federal Emergency Relief Administration has provided him with a first-hand knowledge of much of the depression literature which he reviews.

GEORGE W. HILL

University of Wisconsin

Consumption and Standards of Living, by Carle C. Zimmerman.
New York: D. Van Nostrand Company. 1936. Pp. xvi, 602.
Price, \$3.75.

The author's avowed purpose is to examine some of the pre-

conceptions concerning the nature of a system of living which have become popular during the last four or five centuries in order to determine (1) "the extent to which comparisons of systems of living are justified," and (2), "the cognitive value of such comparative figures, either within a national boundary or between nations" (p. 12). He also aims to describe our systems of living so that our understanding of them may be enhanced. A brief sketch of theories is presented to indicate that the nature of the system of living has been little understood and that throughout the history of thought different points of view on every phase of the problem have been presented.

The world-wide scope of the "comprehensive study of the pertinent empirical materials" is indicated by a tabular summary of the relative expenditure for food as shown by 872 studies in different parts of the world. However, Zimmerman has also "ventured to discuss the existing ideas" on his subject.

Key concepts are system of living, manner of living, standard of living, plane of living, behavior cycle and the material and non-material aspects of standard of living. Systems of living refer to the total individual and group behavior as integrated about the efforts to satisfy desires. Manners of living denote the dominant values implicit in systems of living. The typological conception of *standard of living* is maintained, according to which the standard of living is "the type of behavior which most adequately expresses the dominant values found in the associated manner of living" (p. 6). *Plane of living* represents the purely economic aspects of standards of living.

Expenditures are grouped into five major fields of economic and social desire: food, clothing, lodging, other items of immediate consumption commonly called sundries or "advancement"; and future consumption (saving). The role of these fields in the standard of living is considered and the "laws" relating to each are critically examined.

The survey of studies of family living provides a basic historical foundation in compact form for all workers in the field. Relating consumption to the various schools of economic theory is helpful.

Proponents of contemporary action-programs will find much in this book to provoke them. Zimmerman warns, for example, that "rebuilt houses will not necessarily recreate family and home life for the slum population" (p. 157), nor eliminate delinquency and

improve character. Rather, "the important factor in the formation of character and hence in the standard of living is the family and social organization rather than housing (p. 156)." The ordinary usage of the term "advancement expenditures" contains assumptions and implications which are "positively dangerous" at this particular time, if the author's assumptions are accepted. While "some spending seems socially necessary in depressions," the idea of "spending for prosperity" is not a valid conclusion as "we can only be sure of the 'spending' and not of the 'prosperity' " (p. 353).

The reviewer suspects an occasional gibe at our current ideas of progress and social self-complacency, as illustrated by the following: "There may be many varieties of Grade A milk, all with approximately the same cleanliness, butter-fat content, and bacteria count, but some of the well-to-do families will pay as much as 50% more for milk under a different name on the assumption that it is better. This is a part of the 'magic' which one finds in civilized society" (p. 94).

Analysis typifies the American standard of living, at least in the urban sections, by the characteristics of individualism, sensationalism, and conspicuous consumption. The author believes these characteristics have been over-stressed and, at present, makes the prophecy, if not threatens, that sometime in this century we will be forced back to emphasize many characteristics of life not popular now.

The book is well documented, as is usual of Zimmerman's work. At the beginning of each chapter is a summary of contents. There is not only an index of subjects but an index of names and of cities and countries.

OLAF F. LARSON

Colorado State College

Prosperity and Depression, by Gottfried von Habeler. Geneva: League of Nations. 1930. Pp. 600. \$2.00.

This book is divided into two parts: the first is a systematic analysis of cycle theories; the second is a synthesis of their nature and causes. The following groups of theories are analyzed: monetary, overinvestment, changes in costs and horizontal maladjustments, overindebtedness, underconsumption, psychological, and harvest. Under the latter, some consideration is given to the relationship between agriculture and the business cycle. The con-

tributions of a large number of writers to different theories or variants of theories are discussed, condensed and fitted together.

In view of the current emphasis on the underconsumption theory, it may be well to summarize his analysis on that point. "In its best reasoned form . . . Depressions are caused by . . . too large a proportion (of income) being saved and too small a proportion spent on consumers' goods. The next step . . . is the contention that the cause of oversavings is to be found in the unequal distribution of income. . . . The recipients of large incomes are responsible for most of the savings. The sums saved add to the capital equipment of the community. Thus demand for consumers' goods is reduced. Their supply is increased and their prices must fall." P. 155. To this the author comments: "Much will depend on whether there is a continuous flow or a gradual increase of savings; . . . and whether there is a brisk and continuous demand for new credit (capital) . . . During the depression, demand for new capital is at a low level and inelastic. There is, therefore, a great danger of new savings running to waste instead of being invested. During the upswing, demand is brisk and new savings easily find an outlet in new investment. Can the oversavings doctrine contribute anything to the explanation of the . . . down-turn from prosperity to depression . . . ? It would seem that the rate of savings falls in the later phase of the boom." P. 119. To go on with the case from the point of view of the underconsumption theorist: "It has been argued that the end of the boom comes when the fruits of the new processes which have been initiated with the help of voluntary and forced saving begin to emerge." P. 119. The author then sets forth the views of many persons on this subject and concludes: "The obscurity will remain in the absence of answers to the initial question as to what changes in the flow of money from saving to spending . . . are capable of restoring equilibrium." P. 129.

This quotation brings to mind a leading question: What is the value of these theoretical analysis of cycle theory unsupported by definite objective measurement of reactions of different elements in the economic structure? Theoretical analysis is of value if the premises and logic are correct and the author has done a good job in blending together the widely divergent views of various cycle theorists, but fundamental obscurity remains in the absence of definite testing of the theories by measuring the reactions of different economic groups during the course of the cycle. It is obvious,

of course, that reactions may alter with new conditions and institutions. How does the rise of installment credit affect the underconsumption theory? The amount of such credit was recently estimated at \$9,000,000,000, or about 15 per cent of the annual national income. This might be said to be overconsumption or consumption in anticipation of earnings. When expansion in this item reaches a peak (which presumably will be when credits have reached a certain ratio to consumers' annual income) its failure to expand will curtail consumer buying power and payments on such a debt will absorb a sizeable fraction of current income. This would tend to curtail consumer purchases or at least the rate of expansion in consumer purchases and to check expansion. This suggestion is not introduced as a possible cause for economic cycles, but rather it is mentioned as a new factor which must be measured and reckoned with in a realistic cycle theory.

The comments on agriculture and the business cycle may be of interest. After describing the well-known harvest theories, he comments, "An explanation of the . . . cycles on lines consistent with their agricultural origin is not, therefore, hopeless." P. 143. He recognizes close connection between agricultural output and the industries which utilize and handle agricultural raw materials. The effect of a large harvest on demands for non-agricultural goods will depend on elasticity of demand for agricultural products. The less elastic such demand, the more probable it is that the big crop and the fall in food prices will stimulate demand for other goods from urban consumers; likewise, the lower the demand from agriculture for goods of other industries. The two will cancel out, so far as the general situation is concerned. He clearly recognizes the importance of increased monetary demand on the price of farm products.

In his synthesis of the nature and causes of cycles, the same type of theoretical analysis is followed. No effort is made to check against actual behavior of economic series during the course of the cycle, but many well-considered observations and generalizations are included. In general, it may be said that the author holds to the organic nature of cycles; on the upswings, the process of improvement is cumulative; on the downswings, it is likewise. The significant points in such a process are the points when depression turns to recovery and boom to recession. The author claims no common cause, but says "we can distinguish between two types of forces—viz., those which arise quite independently of the process of expan-

sion or contraction, and those which are . . . brought about by (these) processes." P. 245. In other words, the turning point may be an accidental factor or one generated by the process. People will eventually die of old age, but they may be killed in an accident. In either case, they are dead. So with the turning point in a cycle. "During the course of an expansion . . . the economic system becomes more vulnerable the nearer full employment is reached . . . (and) the system becomes more sensitive to deflationary shocks." P. 259. Regarding revival, the following summarizes the view: "There are many different types of expansionary . . . influences, each of which can conceivably act as a starter. If contraction is under way, a strong expansionary impetus is required to . . . reverse it (but if it) has spent its force, a slight stimulus may . . . start the system on the up grade." P. 282.

This attitude which recognizes, at least theoretically, the wide variety of influences which operate in our complex economic organization is to be commended. One who watches the entire machine will be more likely to keep a machine in good running order than is one who thinks the only reason why a machine will not run is that it is out of gasoline.

L. J. NORTON

University of Illinois

American Economic Development, by A. M. Sakolski and Myron L. Hoch, Thomas Nelson and Sons, 1936, Pp. 448. \$2.50.

"American Economic Development," by A. M. Sakolski and Myron L. Hoch, is intended to be an introduction to present economic problems. The method of treatment is to center attention on the line of evolution in each important phase of national development in lieu of the usual presentation of history by periods. In this way, facts and circumstances are emphasized which are presumed to produce, or to have a bearing on, present economic problems.

The reviewer is impressed with the difficulties of the authors in presenting a complete historical background by the topical method included in the 19 chapters selected to represent the major factors responsible for the economic development of the United States. Readers will find difficulty, also, in getting the causal relation of each factor presented with present economic problems.

As a reference, this book furnishes a background of information

for the use of both teacher and student in Agricultural Economics. Its value would be enhanced if maps and graphs were more easily read on pages 30, 100, 101, 135, 146, 243, 380, and 407. The interpretation of agricultural changes in "eastern agricultural production," page 214, reveals a lack of agricultural background on the part of the authors, where one of the two causes assigned to its decline is the "unwillingness to apply sufficient capital to promote a better system of farming."

Selected references at the end of each chapter are supplemented by an ample list of references called "General Bibliography and Source Materials."

In these days, when admitted "noble experiments" and other experiments are used to solve economic problems, those persons should be praised who attempt to associate past as well as present important factors and forces with current economic problems. The recognition of historical trends should teach us the probability of failure or of success in such experiments.

O. G. LLOYD

Purdue University

Co-operative Insurance, by N. Barou, London: P. S. King & Son, Ltd. 1936. Pp. xiii, 391. 15s 0d.

This book, we are informed in the preface, is the result of three years' study at the London School of Economics. From the point of view of its scope the book may well be conceded to be, as the author designates it, "the first attempt of this kind." Its object, as also stated in the preface, "is to outline the theory and practice of co-operative and mutual insurance throughout the world." . . . "It deals with thousands of co-operative and mutual insurance societies in thirty-five countries . . ."

The first two chapters deal respectively with "Insurance (Nature and Elements)" and "Shortcomings of Popular Insurance." In these chapters such concepts and problems as loss, risk, risk bearing, measurement and classification of risks, lapses, distribution of surpluses, etc. are discussed and definitions and views of many authorities cited.

In chapters III and IV headed respectively "Mutual Insurance" and "Co-operative Insurance," the author attempts to differentiate cooperative insurance from mutual insurance, as well as from "capitalist" insurance. His conception of the difference between

mutual and cooperative insurance is at least partly indicated in the following statement: "A mutual insurance society, however, which operates with a capital or with indivisible reserves, on the principle of fixed premiums and fixed policies, and on a non-profit making basis, is a co-operative insurance society: mutuality and capitalisation thus form the co-operative entity. Mutual insurance is the embryo of co-operative insurance and if conducted on proper lines can grow and develop into co-operative insurance of an effective and progressive type." P. 104. It also is said: "Legally the co-operative insurance company bears much more resemblance to an ordinary insurance company with fixed premiums than to a mutual society." P. 125.

American writers on insurance, in contrast with Mr. Barou's views, are inclined to apply the term "cooperative insurance," when they use it at all, to small and local assessment companies or associations, which are managed, at least to a considerable extent, directly by the members. The term "mutual" is used by them to indicate all kinds of insurance organizations, regardless of the volume of business or of reserves, provided they have no capital stock and are legally owned by the members or policy-holders. In other words, as these terms are generally used in America, it would be more nearly correct to say that cooperative insurance has been the embryo of mutual insurance, than to say that mutual insurance is the embryo of cooperative insurance.

Most of the later chapters of the book as well as parts of III and IV deal with specific cooperative or mutual insurance developments and organizations in various countries. These cooperative or mutual insurance organizations are grouped in a general way under consumers' societies, labor institutions, agricultural general, and agricultural special. The two-fold classification of agricultural insurance societies reflects the fact that in certain countries a single organization may and does engage in many kinds of insurance. Other organizations, regardless of whether or not a wider range of activities are permitted by law, limit themselves essentially to one kind of insurance only, such as life insurance, fire insurance, livestock insurance, burglary insurance, hail insurance on growing crops, etc. A special chapter is given to insurance societies by and for employees of societies or organizations engaged in cooperative merchandising. This chapter, as well as the other chapters referred to in this paragraph, is replete with historical and statistical data

pertaining to numerous insurance organizations in different countries.

Any one who has gathered information on a given subject from a large variety of sources, is aware of the difficulty of interpreting the data collected, as Mr. Barou freely endeavors to do. This difficulty is specifically recognized by the author.

In the case of much of the factual material presented, the reviewer has no means of checking the correctness either of the data or of its interpretation. Certain statements regarding mutual or cooperative insurance in the United States, contain minor errors. On page 90, for example, the author refers to various groups of so-called class mutuals such as grain dealers' mutuals, millers' mutuals, etc. In this list occurs "engineers' " mutuals while the context and the source of the enumeration quite clearly indicate that what was meant was "ginners' " mutuals. On page 274 occurs the statement: "The hail insurance companies in the United States make use as a rule of two types of insurance contract: either a hail-damage clause is added to the policy of insurance against tornados or windstorms, or they issue a special policy for hail insurance." A hail-damage clause is frequently used in connection with windstorm insurance, in order to include the minor hazard of hail, when such insurance applies to buildings or personal property. "The hail insurance companies in the United States" means to the American reader, the companies writing hail insurance on growing crops, which is quite a different thing from incidental hail protection on buildings.

References to sources of material are liberally given but unfortunately some of them are not sufficiently complete to constitute convenient guides. A footnote on page 192, for example, reads: "United States Department of Agriculture, No. 195, 1924." The United States Department of Agriculture has many series of publications with different serial numbers. Hence a reference to said Department followed by a serial number and a year does not specifically identify the publication in question.

In general the book impresses one as being somewhat lacking in logical presentation. This may be due in considerable measure to the nature of the material with which it deals representing numerous types of insurance organizations in many different countries. It is more difficult to overlook the author's failure in a number of instances to make his statements more simple and clear. As a

rather extreme example of such failure may be cited the following sentence from page XII of the Preface: "Popular insurance, though of the greatest importance for the working population, is not covered sufficiently by social insurance and is not served satisfactorily by profit-making insurance companies." Part of what is here said about "Popular insurance" would seem to apply to insurance now carried by, or available to, the masses as distinguished from the classes. Other parts would seem to apply to the *need for insurance* on the part of the masses, rather than to the insurance which they either carry or have available to them.

The reader of this book can hardly help being impressed with the volume and range of the theoretical as well as factual material, including statistical data, that the author has collected, and with the work necessarily involved in classifying and analyzing this material. Although the analytical statements and conclusions are in many instances somewhat difficult to follow, the book, in addition to a large array of facts, offers numerous interesting leads in a field in which little comprehensive information has hitherto been available.

V. N. VALGREN

Farm Credit Administration

Crop Management and Soil Conservation, by Joseph F. Cox and Lyman E. Jackson, New York: John Wiley and Sons, Inc. 1937. Pp. xvii, 610. \$2.75.

This textbook for use in Smith-Hughes vocational agriculture classes departs from the usual form followed by texts on crops and crop production. Of particular interest to farm management specialists and economists concerned with conservation of the soil is a number of chapters in Part I. Here the authors have presented the essential facts bearing on the problem of soil conservation facing the nation today. They have made liberal use of photographs and charts from the United States Department of Agriculture to illustrate both the conservation and economic problems facing the producers of crops.

The AAA programs are described briefly and the economic problems of crop producers are discussed in a chapter on "Marketing Crops and Federal Programs for Agriculture." Another chapter which will give the users of this text a broader viewpoint than the

mere technique of producing crops is one entitled "Surveying Crop Production from the Farm Management Standpoint."

Part II deals with the technical information on the production of the individual crops.

WALTER W. WILCOX

Iowa State College

Land Utilization and Rural Economy in Korea, by Hoon K. Lee.
Chicago: The University of Chicago Press. 1936. Pp. 289. \$3.00.

The investigations reported in this book were made in 1931 and 1932 "at the request of the Institute of Pacific Relations and under the direction of the American Geographical Society." This sponsorship, together with the suspected direct or indirect influence of the Cornell University research method, causes the book to be a concentrated compilation of highly useful descriptive factual and statistical material and, although rather tedious, an excellent reference book on a multitude of subjects in the field of agricultural economics. In the light of the condition of Oriental statistics, the book, together with those of this series previously written by J. Lossing Buck and Shiroshi Nasu, respectively, constitutes a distinct step in world enlightenment on Oriental economic problems.

The 132 tables are each described in numerical terms in the text which carries through the entire book a baleful story of suppression and exploitation of the Koreans by the Japanese. Japanese enjoy the plentiful game supply to the exclusion of the Koreans. They own nine-tenths of the total capital investment in industry. Commerce and shipping are monopolized by Japanese merchants. The sites of the newly constructed roads were confiscated. Most of the remunerative government positions are held by Japanese who are better paid than the Koreans of the same rank. The teachers in the schools from the primary grades to the colleges are largely Japanese. Education facilities for Koreans are limited. Almost no Korean organizers of land reclamation are benefited by the generous subsidies extended for such work. Since annexation of Korea in 1910 the ownership of land by Japanese has increased by "leaps and bounds." The bitter hatred which had existed before has been intensified, leading to bitter disputes between landlord and tenant. Attractive leases for afforestation of public lands benefit Japanese lease holders. Wages paid for Japanese laborers are higher than for Koreans giving the same type and quality of service. Under the

systematic and effective credit system Korean farmers are getting more and more into debt, "since the credit organization is not of, by, and for the Korean farmers, but largely Japanese in managerial personnel and operating funds." The Oriental Livestock Company organized by Japanese for buying farm cows "charges a rate of interest which comes near to extortion, namely 20 per cent annually at the lowest." Koreans are barred from migrating to Japan. Per capita consumption of rice in Korea is decreasing while in Japan and Formosa it has been maintained. Koreans are producing rice and selling it to buy millet, a cheaper and less desirable food, all of which has led to a deep-seated bitterness. Two-fifths of the Korean rice crop is marketed while thousands of small-scale Korean farmers and their families are starving.

This is the theme that is woven in and out among statistics of land utilization, geology, geography, population, land ownership and tenancy, capital investments, production, farm labor, rural credit marketing, prices, farm income, standard of living, and agricultural colonization. Each of these subjects, dealt with in quantitative terms, condenses material enough for a five-foot shelf of books into the space of 289 pages.

The outstanding fact is that Korea, a country of 20 million people now on the increase, having only one-fifth of its total area in arable land, a cold winter climate and damaging rain storms prevailing over a large portion of the country, produces its food supply on farms, including the larger estates, averaging 5.4 acres in size. Excluding the large holdings, tenant farms average 3 acres in size, while full-owner and part-owner farms average 3.8 and 4.6 acres respectively. Almost half of the Korean households are those of tenants.

The total acreage of arable land in 1930 was 11,384,000 acres. Paddy fields comprise more than a third of this area. Rice is the most important field crop, it comprises more than one-fourth of the total value of all products, agricultural, industrial, commercial, etc. From 1910 to 1930 the acreage in rice, according to government statistics, increased 18 per cent while the production increased 59 per cent. Government statistics on rice yields in Korea, however, must be scrutinized carefully for they do not agree with those obtained in field investigations. More than three-fourths of the rice crop is produced in the south and western half of the country. Other important crops are barley, Italian millet (sorghum), soya

beans, millet, upland rice, mung beans, hemp, perilla, tobacco, peas, and ramie.

Nearly four-fifths of Korea is covered by forest, subject to much abuse in the past, a large proportion of which is now in public ownership. The activities of the government in acquiring and managing these as well as public policies of "land amelioration," colonization, credit and marketing control, have been both praised and condemned. An attempt at describing these here would be futile.

DAVID WEEKS

University of California

German Forestry by Franz Heske (with a preface by Henry Graves, Dean of the School of Forestry in Yale University) Yale University Press, New Haven. 1938. Pp. xxv, 342. \$3.00.

This valuable contribution to the literature of forestry should also be of interest to agricultural economists who are studying problems of land use and tenure and endeavoring to formulate policies to help solve these difficult problems in the United States.

"German Forestry" was written originally in German by Dr. Franz Heske, Director of the *Forstliche Hochschule* in Tharandt, Saxony. The work was made possible by a grant of the Oberlaender Trust of the Carl Schurz Memorial Foundation. This organization invited Dr. Heske to the United States in 1934 to study conditions here with a view toward obtaining from him a description of German forestry which would be primarily of value to American foresters. The German manuscript was translated by A. B. Recknagel of Cornell University, and both the original and translation were edited by W. N. Sparhawk of the United States Forest Service. The thoroughness of this cooperative undertaking is apparent in a readability which is seldom attained in a translation.

Practically half of this book (twelve of the twenty-eight chapters) bears on subjects pertaining to agriculture as well as forestry. The first chapter traces the historical development of land use in Germany and gives evidence to show the stability of the present land use pattern and the absence of conflict between the various uses.

After devoting two chapters to the presentation of statistics of forest resources, Dr. Heske describes the evolution of public and private property in Germany. He contends that three types of ownership are most conducive to efficient permanent management

of forests: (1) The State, (2) the "entailed" estate (*Fideikommis*—a kind of joint ownership between the State and a family succession), and (3) the coöperative (*Genossenschaft*). He does not recommend the corporation or the partnership because of their principal interest in immediate profits. He claims that large holdings are more efficient than small holdings, but predicts that small forests will be rendered more efficient by coöperatives in the future. In another place Dr. Heske describes the entailed estates. In the management of these estates the private owner is allowed considerable freedom, although a measure of control is exercised by the State. The disadvantages of strict State control are emphasized and a program of education and coöperation is recommended.

In a chapter given to a treatment of tenure of forest property Dr. Heske explains the difference between the Germanic and Romanic concepts of land ownership. He holds that the German farmer has always resisted the change to Roman law and as a result soil depletion has not been encouraged by the breaking up of farms by inheritance. A fixed tenure is a prerequisite to good agriculture and forestry; accordingly the hereditary farmstead law of 1933 (*Reichserbhofgesetz*) created a fixed tenure for small properties. Closely related to problems of tenure is the resettlement program in Germany. The objective of this movement is decentralization from the cities and the encouragement of settlement in rural areas. Legislation designed to bring about such a shift is described.

In line with her policy of self-sufficiency in as many fields as possible, Germany is seeking means of increasing her timber yields. The efforts in this direction include afforestation of waste and submarginal farm lands, of which there is a total of about five million acres in Germany, and better management of farm forests, particularly in the regulation of pasturing and gathering of leaf litter. The intimate connection between farm and forest in Germany is well demonstrated and the opportunities for auxiliary farm labor in well managed woodlots are emphasized. The indirect benefits from forests, which appear to be more cogent in the old world than in the new, are enumerated and clearly explained.

The framers and proponents of the Soil Conservation Districts laws will find several precedents in the German forest devastation law (*Reichswaldverwüstungsgesetz*) of 1934. Another law of the same year transferred all activities in forestry and game management from the states to the *Reich*.

Students of public finance should welcome Dr. Heske's excellent general description of the present German tax system. The author also shows that the public forests of Germany make a significant contribution to public finance; furthermore, that the State forests exhibit the lowest ratio of expense to income of any of Germany's public enterprises.

ROY B. THOMSON

Iowa State College

The Hill Country of Northern New England: Its Social and Economic History, 1790-1930, by Harold Fisher Wilson, New York, Columbia University Press, 1936. Pp. xii, 455. \$4.25.

This is an historical presentation of the permanent and underlying forces affecting the life of the people in northern New England, including Maine, New Hampshire and Vermont. New England Hill country has passed through a long and difficult period of transition, and even yet has not adjusted itself to modern conditions. This regional history tells the story of that change from the period of northern New England's widespread settlement to the present time.

The book is divided into four seasons: the first represents summer from 1790 to 1830, in what was termed the "age of self-sufficiency." This age was characterized by the most rapid growth which northern New England has experienced.

The second period, autumn, from 1830 to 1870, was marked by the coming of the railroad, unrest caused by the Civil War, and the growth of the sheep industry. The opening up of new territory in the Mid West lured many northern New Englanders to more fertile fields of opportunity. Consequently the increase in population in this period was very small compared to that from 1790 to 1830.

The third period, winter, from 1870 to 1900, represents the most discouraging period of northern New England's history. During this time, the competition of a grain-growing Mid West practically destroyed grain production in this area. This resulted in a widespread desertion of farms and a pronounced decline in rural population.

The fourth period, spring, from 1900 to 1930, saw the emergence of the dairy industry supplying fluid milk to the Boston market and the development of the summer recreation industry. These two

industries have practically revolutionized the economic and social life of northern New England. Along with these economic changes came the organization of the farm extension work, introduction of the daily mail service, and the application of inventions such as the automobile and telephone. The automobile resulted in an abandonment of many rural churches and changed the location of community centers from the small villages to the larger towns.

Speaking as one Vermonter to another, it seems to me that Mr. Wilson has done an excellent piece of work in portraying the changes in the economic and social life of northern New England. His statistical basis of presenting facts gives his work a solid foundation. His close contact with the dynamic forces in the picture gives the reader a realistic impression of what exists today in this area.

R. W. BARTLETT

University of Illinois

Farewell to Poverty, by Maurice Parmelee. New York: John Wiley & Sons, Inc. 1935. Pp. 479. \$3.50.

This is a book that you should read. If you are one who believes in the inevitable and final destruction of *Capitalism*, here is fuel for the fire. The reviewer knows of no arguments against capitalism which are not to be found in the book. If you believe capitalism can be modified to become socially justified, there is ample stimulation of thought. Many will violently disagree. To the orthodox economist the book is economic heresy. In the judgment of the reviewer the book had better have been named "The Decadence of Capitalism" with a subsequent title of "An Apology for Russian Communism."

Many of the chapters remind one of a student thesis padded by repetitious factual material to gain length rather than to add strength to the arguments.

Part two of the book is entitled "Evolution of the Social Commonwealth." This is a very interesting portion of the book because of the diversity of philosophical concepts as to the coming World State, which seems to have its prototype in Soviet Russia.

The reviewer sees no necessity of arguing with the author, and has merely tried to give a few sidelights of what is to be found in the book.

A. A. HOLTZ

Kansas State College

NEWS ITEMS

American Sociological Society

At the recent meeting of the American Sociological Society at Atlantic City, the rural sociologists organized the Rural Sociological Society of America, with a provisional constitution. This is an autonomous organization, but if proposed amendments to the constitution of the American Sociological Society are passed, it will form a section of that organization. The officers elected are: President, Dwight Sanderson, Cornell University; vice-president, John H. Kolb, University of Wisconsin; secretary-treasurer, T. Lynn Smith, Louisiana State University; and other members of the Executive Committee are Carl C. Taylor, U. S. Bureau of Agricultural Economics, and C. E. Lively, Ohio State University. The new society will continue the publication of *Rural Sociology*, now in its third year, with the support of Louisiana State University.

American Farm Economics Association

The membership of the American Farm Economic Association was measurably increased recently by the addition of a large number of workers in the field of crop and livestock estimates. Although the Association has had a number of state and federal statisticians on its membership roll for some years, the addition of new members following the national meeting held at St. Louis on March 21 to 25, is the largest number to become affiliated at one time. The recent meeting was the first time the workers have met in a national gathering since 1926, and was attended by representatives from the various states, Canada, and Washington. Next year marks the 100th anniversary of the beginning of the agricultural statistics work by the federal government.

American Institute of Cooperation

The American Institute of Cooperation will meet in Pullman, Washington, and Moscow, Idaho, from July 11 to 16, 1938.

A Cotton Institute has recently been organized at the University of Tennessee, to coordinate research regarding cotton in the various departments.

The Social Science Research Council receives inquiries from time to time for sets of the publication "Research Method and Procedure in Agricultural Economics." If any reader of the JOURNAL OF FARM ECONOMICS knows of any sets that are available, will he

kindly communicate with Secretary Robert T. Crane of the Social Science Research Council, or with Professor John D. Black of Harvard University.

R. H. Allen, formerly of the Resettlement Administration, George Haythorne, formerly of McGill University, Glenn Craig, formerly of the Canadian Department of Agriculture, John E. Guthrie, formerly of the University of Manitoba, and Lloyd G. Reynolds, formerly of McGill University, are assisting with teaching and research at Harvard University during the present year.

Edward Allen joined the Economics staff at Iowa State College in September 1937. Allen took his graduate work in economics at the University of Minnesota where he was recently engaged in teaching.

Carl Alsberg has been chosen Director of the Giannini Foundation of the California College of Agriculture, taking the place of H. R. Tolley, who is now with the Agricultural Adjustment Administration in Washington, D. C. Doctor Alsberg was formerly head of the United States Bureau of Chemistry, and at the end of the World War, when it was desired to make use of the great accumulation of data and records of the Foods Administration, the Food Research Institute was formed at Stanford University, and Doctor Alsberg has been directing the work at that institution.

In the Bureau of Agricultural Economics, division leaders working directly under Dr. L. C. Gray, Assistant Chief, are:

Paul L. Koenig, Division of Land Acquisition; W. M. Russell, Division of Land Development; Morris M. Kelso, Division of Land Economics; and C. L. Clayton, Division of Project Organization.

Two regional offices have been established to carry out the land use program under the Bankhead-Jones Act. The northern Great Plains region, which includes Montana, Wyoming, North Dakota, South Dakota, Nebraska, and part of Colorado, has been placed under the direction of Rex E. Willard, with headquarters at Denver, Colorado. The southern Great Plains region, which covers part of Colorado, Kansas, Oklahoma, New Mexico, and Texas, has been placed under the direction of James C. Foster, with headquarters at Amarillo, Texas.

B. R. Stauber and Dr. Carleton P. Barnes, both formerly with the Division of Land Economics, have joined the Office of Land Use Coordination of the Department, under Milton S. Eisenhower. Mr. Stauber will have immediate responsibility for general land policy coordination, and Dr. Barnes for survey coordination.

John C. Dreier, who has been working with Dr. Gray, has now joined the Division of Economic Information and has been assigned to work on land use information.

The following change in assignment in the Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, have been made:

D. A. McCandliss went to Sacramento, California, in December to assist in reorganizing the work of the California office, incidental to the retirement of E. E. Kaufman in January.

A. R. Tuttle, until recently secretary of the Crop Reporting Board, has been transferred to the Livestock section to work with C. F. Harlan.

Lester H. Wiland has been brought in from the Columbus, Ohio, office to serve as secretary of the Crop Reporting Board.

O. M. Frost has been transferred from West Lafayette, Indiana, to Columbus, Ohio.

R. H. Baker has been appointed research assistant in the Department of Rural Economics, Ohio State University.

Byford W. Bain, who has been an assistant on the staff of the Department of Agricultural Economics, University of Illinois, has resigned to accept a position with the St. Louis Milk Market Administration. His position on the staff of the Department of Agricultural Economics has been filled by Mr. E. N. Searls.

Wilbur A. Baldwin, formerly with the Division of Crop and Livestock Estimates of the Bureau of Agricultural Economics, U. S. Department of Agriculture, was appointed a member of the staff of the Economics Subdivision of the Farm Credit Administration, Washington, D. C., on March 1, 1938.

R. H. Bauman, Purdue 1923, accepted the position of Extension Economist in Farm Management at Purdue University effective November, 1937.

Beverley M. Bowie and Mr. Russell Smith have been appointed to the Division of Economic Information, Bureau of Agricultural Economics, as land economics writers, in a section under the supervision of Mr. John Dreier, that will handle exclusively land use information.

Gordon P. Boals, Bureau of Agricultural Economics assistant agricultural commissioner, has returned to his station in Berlin, Germany, after three months' official leave and work at headquarters.

Karl Brandt, formerly director of the Institut für Landwirtschaftliche Marktforschung, Berlin, and since 1933 professor of

agricultural economics at the New School for Social Research, New York City, has been appointed economist and professor of agricultural economics, Food Research Institute, Stanford University, from September 1, 1938. Dr. Brandt was visiting research professor at Louisiana State University in the summer and fall terms of 1937-38.

Raymond G. Bressler, Jr., has resigned his position as Assistant Agricultural Economist in the Division of Program Planning of the Agricultural Adjustment Administration to succeed Dr. Roger B. Corbett as Executive Secretary of the New England Research Council on Marketing and Food Supply.

Alfred C. Brittain, agricultural statistician, Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, has been designated acting statistician in charge of the office at Columbia, Missouri, in place of Mr. E. A. Logan, deceased.

W. Herbert Brown, formerly with the Connecticut State College is at the present time Research Assistant in Agricultural Economics at Harvard University.

Dr. Frank W. Brumley, Extension Economist in Farm Management at the University of Florida since 1930, resigned to accept the position of Professor of Farm Management at Louisiana State University, effective September 1, 1937.

Robert H. Burns, for the last thirteen years wool specialist at the University of Wyoming, has joined the Division of Livestock Meats and Wool, Bureau of Agricultural Economics, to direct and coordinate the work of the Wool Section in wool standardization, scouring, and research.

Joseph R. Cavanagh is now associate agricultural economic writer in the Division of Economic Information, Bureau of Agricultural Economics, by transfer from the Office of Information of the Department, where he was engaged in writing farm flashes, which are syndicated to local radio stations through the State Extension Services.

Owen L. Dawson, Bureau of Agricultural Economics agricultural commissioner, has returned to his station at Shanghai, China, after several months' work in the Philippine Islands as adviser to the Joint Preparatory Committee on Philippine Affairs.

W. J. Edens who received the Ph.D. degree in Rural Economy at Cornell University last June is now teaching Agricultural Economics courses at Western Kentucky State Teachers College.

Dalson H. Esry, Instructor in Agricultural Economics, University of Tennessee, has resigned to accept a position as farm supervisor for the Equitable Life Assurance Society.

George B. Fiske, market news writer in the Bureau of Agricultural Economics since 1917, has retired.

John R. Fleming was appointed Director of Economic Information of the Bureau of Agricultural Economics effective January 17. Mr. Fleming was agricultural news editor at Ohio State University from October 1923 to May 1930 when he became a special agricultural writer in the Office of Information of the U. S. Department of Agriculture detailed to the Office of the Secretary. Since January 1934 he has been Assistant Director of the Office of Information and in recent months Acting Director.

Gwynn Garnett, recent graduate student in agricultural economics at Iowa State College, has taken a position as Assistant Statistician with the Federal Land Bank of Omaha.

Mary Geraghty, is now employed as research assistant in the Department of Agricultural Economics at the University of New Hampshire.

J. Barnard Gibbs, Bureau of Agricultural Economics assistant agricultural commissioner, left Shanghai, China, in October for Calcutta, India, to make a tobacco investigation.

R. E. L. Greene, Assistant Agricultural Economist, has returned to the North Carolina Agricultural Experiment Station after a year's leave of absence for study at Cornell University.

I. F. Hall, who was on a leave of absence for one semester and was associated with the Federal Land Bank of St. Paul, returned to the Agricultural Economics Department at Wisconsin in February.

Orville J. Hall, Assistant Professor of Agricultural Economics, University of Arkansas spent the winter quarter at the University of Minnesota in graduate study.

Donald O. Hammerberg, Assistant Professor of Agricultural Economics at Connecticut State College has been appointed Agent in the Division of Marketing Research, Bureau of Agricultural Economics (on a part-time basis) to direct the research work conducted by the New England Research Council.

C. M. Hampson who has been Regional Chief of the Loan and Collection Section of the Farm Security Administration, Raleigh, N. C. for the past two years, has become Extension Economist in Farm Management at the University of Florida. Previous to going with the Farm Security Administration, Mr. Hampson was with the Department of Agricultural Economics of South Dakota State College.

Arno J. Hingas, former research assistant in Agricultural Economics at the University of New Hampshire, during the past year has been taking graduate work in the Department of Agricultural Economics and Farm Management at Cornell University.

N. W. Hazen, Bureau of Agricultural Economics went to Egypt, his native land, in December, and returned March 1. He studied the citrus fruit industry in Egypt and in Palestine.

Roy F. Hendrickson, Director of Economic Information of the Bureau of Agricultural Economics, since May 1936 became Assistant Director of the Office of Personnel, U. S. Department of Agriculture, on January 17, 1938.

William E. Hendrix, Assistant Supervisor of Rural Research, University of Tennessee, has resigned to accept a position as Assistant Agricultural Economist at the Georgia Experiment Station. He has been replaced by E. E. Briner who received his undergraduate training at Ohio State and his graduate training at University of Tennessee.

Clarence L. Holmes, Division of Farm Management and Costs, Bureau of Agricultural Economics, resumed work at the office on April 1, after absence since October, 1936.

Horace C. Holmes, who has been on leave of absence from his duties as Assistant Extension Specialist in Farm Management, University of Tennessee, has completed the requirements for the Master's degree at Cornell University.

Earl M. Hughes, who has been taking graduate work at Cornell University for the past three years has accepted a position in Agricultural Economics at the University of Illinois.

Roberto Huyke, M.S.A., Cornell 1937, recently returned to Puerto Rico and is now associated with the Division of Agricultural Economics, University of Puerto Rico.

Don R. Keene, formerly with the Division of Land Use Planning, Resettlement Administration at Ames, Iowa, has been appointed Acting Instructor in Agricultural Economics at the North Dakota Agr. College, taking the place of Professor Benj. V. McCaul who is on a year's leave of absence with the Federal Land Bank of St. Paul.

Gunnar S. Klemmedson has left his position at Colorado State College to join the staff of the Division of Project Organization, Bureau of Agricultural Economics, at Washington, D. C.

Robert L. Lang, has been appointed research assistant in range and ranch management at the University of Wyoming.

Marc C. Leager, formerly Associate Professor in the School of Business and Science at the University of North Carolina, was transferred to the Department of Agricultural Economics and Rural Sociology, effective January 1, 1938.

B. C. Lemke, former graduate student at the University of Wisconsin and instructor of accounting at the University of North

Dakota, has joined the Economics staff of Iowa State College as instructor.

H. W. Leonard, formerly Farm Management Field Representative with the Metropolitan Life Insurance Company, accepted a position effective October 1, 1937 as Assistant Professor of Agricultural Education at Purdue University.

Gustavus A. McLaughlin, a graduate of the University of Maine in 1937, is temporarily employed on a study of marketing of Maine potatoes financed by the Maine potato industry tax.

Elgin E. McLean, for the last two years junior Chief Reviewing Appraiser with the Farm Credit Administration at Washington, D. C., is now connected with the Farm Mortgage Department of the Equitable Life Assurance Society, at New York, N. Y.

Harry E. Malmsten, recently with the San Francisco regional office, Land Utilization Division, has joined the staff of the Division of Project Organization, Bureau of Agricultural Economics, at Washington, D. C.

L. D. Mallory, Bureau Agricultural Economics assistant agricultural attaché at Paris, France, has been home on official leave.

J. Clyde Marquis, delegate of the United States to the International Institute of Agriculture at Rome, came to this country in late September for a series of conferences regarding the work of the Institute. The next General Assembly of the Institute will be held in May, 1938, plans for which include a proposal for a survey of world agricultural resources, a project covering several years' work.

Cap E. Miller, Head of the Department of Agricultural Economics, N.D.A.C., was re-elected secretary-treasurer of the Northwest Farm Managers Association at its thirtieth annual meeting in March, 1938, at Fargo, North Dakota.

H. E. Moore resigned his position as Extension Economist, Farm Management, Purdue University, November 1, 1937 to accept the position of Conservationist, in Charge of Farm Management, with the Soil Conservation Service at the Benton County, Indiana, project.

William H. Moore, a former research fellow at the Brookings Institution and investigator for the Treasury Department, was appointed a member of the staff of the Economics Subdivision, Farm Credit Administration, Washington, D. C., on February 16, 1938.

Albert H. Mussman, a graduate assistant in the Department of Agricultural Economics, was recently appointed to a full time position as Junior Agricultural Economist, Division of Land Eco-

nomics, Bureau of Agricultural Economics, in the office of Mr. Ross J. Silkett, State Land Use Planning Specialist for Missouri.

Lowry Nelson, Rural Sociologist at the University of Minnesota, participated in the conference on agricultural labor held at Geneva in February.

Dorothy Nickerson, color technologist of the Division of Cotton Marketing, Bureau of Agricultural Economics, was honored by election to the office of Secretary of the Inter-Society Color Council, a professional organization which consists primarily of national societies and associations interested in color, together with some individual members, and was established for the purpose of stimulating and coordinating the work being done by the associations in regard to standardization, description, and specification of color, as well as to promote the practical application of results of the work to problems arising in science, art, and industry.

Joseph L. Orr, in charge of work on grain crops in the Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, transferred to the Division of Program Planning, AAA, on March 4. Mr. R. K. Smith of the Division of Crop and Livestock Estimates will take over Mr. Orr's work on grain crops.

H. S. Patton, Head of the Department of Agricultural Economics, Michigan State College of Agriculture, has been granted a year's leave of absence to accept an appointment as assistant chief in the office of the Advisor on International Economic Affairs, in the Department of State, Washington, D. C.

Frank Peck has resigned as Director of Agricultural Extension and Vice Director of the Agricultural Experiment Station, University of Minnesota, to become President of the Federal Land Bank at St. Paul.

Clarence L. Pier, who has been (since March, 1924) in charge of the market news and inspection work in dairy and poultry products at Chicago for the Bureau of Agricultural Economics, has transferred to the Commodity Exchange Administration as senior commodity exchange investigator. Mr. Bruce S. Mars, associate marketing specialist of the New York office of the Division of Dairy and Poultry Products, has been transferred to the Chicago office where he will be acting in charge.

Whiton Powell of Cornell University has been on sabbatical leave during the term and has been working with the Farm Credit Administration on a national survey of farmers' cooperatives.

Paul E. Quintus has resigned his position with the Department of Agricultural Economics of Iowa State College to accept an appointment with the Cooperative Division of the Farm Credit Administration.

John R. Raeburn, who received the Ph.D. degree in Farm Management at Cornell last year, is located at Hankow, China, where he is in charge of the work in Prices and Statistics for the Department of Agricultural Economics of the University of Nanking.

Carl F. Reuss, who received his Ph.D. degree in Sociology at the University of Virginia, June 1937, joined the staff of the Division of Farm Management and Agricultural Economics, Agricultural Experiment Station, State College of Washington.

Woodrow W. Rufener, formerly Land Planning Aide of the Resettlement Administration, Manhattan, Kansas, has joined the staff of the Division of Farm Management and Agricultural Economics, Agricultural Experiment Station, State College of Washington.

Ralph Russell, who was formerly Assistant Professor of Agricultural Economics at the University of Maryland, has accepted a position with the Farm Credit Administration. He is making a study of Farm Credit Unions in the Middle West.

G. A. Sallee, who has been working on the federal study of labor requirements in agriculture, returned to his position at the University of Minnesota on January 1.

Morse Salisbury for several years Chief of the Radio Service, Office of Information, U. S. Department of Agriculture, has been made Assistant Director of the Office of Information. Mr. Wallace Kaddery of the Radio Service succeeds him as Chief.

Leonard A. Salter, Jr., has resigned his position as Research Assistant and Instructor in Economics at the Connecticut State College to become acting Chief of the Division of Land Economics of the Bureau of Agricultural Economics, Region I.

George A. Scott has been appointed State statistician in charge of the cooperative crop reporting service in California, maintained by the California Department of Agriculture and the Bureau of Agricultural Economics, U. S. Department of Agriculture, succeeding E. E. Kaufman, retired. For the last ten years Mr. Scott has been the regional livestock statistician with headquarters at Sacramento.

Lauren K. Soth has returned to the Extension Service, Iowa State College of Agriculture, after a year spent in the Division of Economic Information, Bureau of Agricultural Economics, Washington, D. C., on special publication work.

Gordon W. Sprague, Division of Dairy and Poultry Products, Bureau of Agricultural Economics was transferred from Washington D. C., to Chicago, Illinois, to take charge of the Branch Office of the Division there, on January 1, 1938. Mr. Sprague has been in charge of the economic research section of the division since July

1, 1933, and besides continuing the research projects will have charge of the market news and grading and inspection activities of the Chicago office.

Charles L. Stewart of the University of Illinois is on sabbatical leave, making a study of land valuation and land appraisal methods in a number of European countries. He will return to Illinois September 1.

E. G. Strand has been appointed research assistant in agricultural economics at the University of Minnesota.

T. L. Stuart, formerly a graduate assistant in the Department of Agricultural Economics and Rural Sociology at the University of North Carolina, has accepted a position as Assistant Statistician with the North Carolina Department of Agriculture.

William G. Sullivan, is now employed as Assistant Agricultural Economist in the Dairy Section of the Agricultural Adjustment Administration, Washington, D. C.

P. E. de Waal, who received the M.S. degree in Farm Management at Cornell University last June, has returned to South Africa where he is attached to the Department of Agriculture.

Charles H. West, Assistant to the President of the Federal Land Bank of Berkeley, formerly on the staff of the Giannini Foundation, University of California, was appointed statistician, Farm Credit Administration of Berkeley, on January 1, 1938.

J. E. Wills, formerly of the University of Illinois, has been appointed Associate Professor of Agricultural Economics, University of Tennessee. He will devote special attention to teaching and research in farm management.

W. T. Yang, who received the Ph.D. degree in Business Management at Cornell University last June, returned to China. He is connected with the University of Nanking and is located in Hankow.

C. O. Youngstrom will return from doing graduate work at the University of California in June to continue his work in the Department of Agricultural Economics at the Idaho Agricultural Experiment Station.

William H. Nicholls has been appointed to the position of Research Assistant at Iowa State College. His special field is marketing of dairy products.

E. L. Cady has resigned from the Extension Service of Iowa State College to accept a position in the new Division of Crop Insurance in the U. S. Department of Agriculture.

George M. Fuller resigned his position in the Department of

Economics and Sociology at Iowa State College to become Treasurer of the Federal Land Bank at Omaha.

Mr. D. A. Fitzgerald of the Agricultural Adjustment Administration has been a resident consultant in the Graduate School of Public Administration at Harvard during the second half year. Resident consultants included A. W. Stewart, J. W. Fleming, O. J. Scoville from the Resettlement Administration.

Erling Hole has joined the staff of the United States Department of Agriculture.

George V. Haythorne accepted the position of Secretary of the Economic Council of Nova Scotia.

The Graduate School of Public Administration, Harvard University, for 1938-39 will offer an advanced seminar in Agricultural Forestry and Land Policy under J. D. Black, assisted by professors from other departments. Participation in this seminar is limited to graduate students. The nucleus of the seminar consists of a number who have been awarded Littauer fellowships.

David. A. Coleman, in charge of the Milling, Baking, and Chemical Laboratory of the Grain Division, Bureau of Agricultural Economics, passed away on February 25, after an illness of two weeks. For 22 years Dr. Coleman was engaged in important research projects, including moisture tests for grains, oil tests for flaxseed and soybeans, and investigations of factors of evaluation for malting barley and wheat.

Otto G. Johanningsmeier, who for nearly 10 years was in charge of the Farm Management Extension work in Indiana, died at his home in West Lafayette, Indiana, January 25, 1938, age 39 years. His passing removed from Purdue University one of its most promising and gifted staff members.

Eugene A. Logan, Agricultural Statistician, Division of Crop and Livestock Estimates, Bureau of Agricultural Economics, in charge of the work in Missouri, passed away suddenly in Columbia, on March 5, at the age of 65 years. Mr. Logan's service in crop and livestock estimating work in Missouri covered a period of twenty-three and one-half years, prior to which he had been employed in statistical work in the Bureau of Labor for nine years.